

Attachment

C

United States Dept. of Labor
Office of Administrative Law Judges

case #: 2019CFP00001¹

Del Signore v. NOKIA

Exhibit L

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[L-1] Introduction

The Universal Service Fund is a telecommunications subsidy that is paid for by US consumers on their phone and cable bills. This fee is collected by the US government and distributed to a network of approximately 2400 small telecommunications corporations (small telcos) in all 50 states and several US territories.

¹ <https://www.oalj.dol.gov/#>

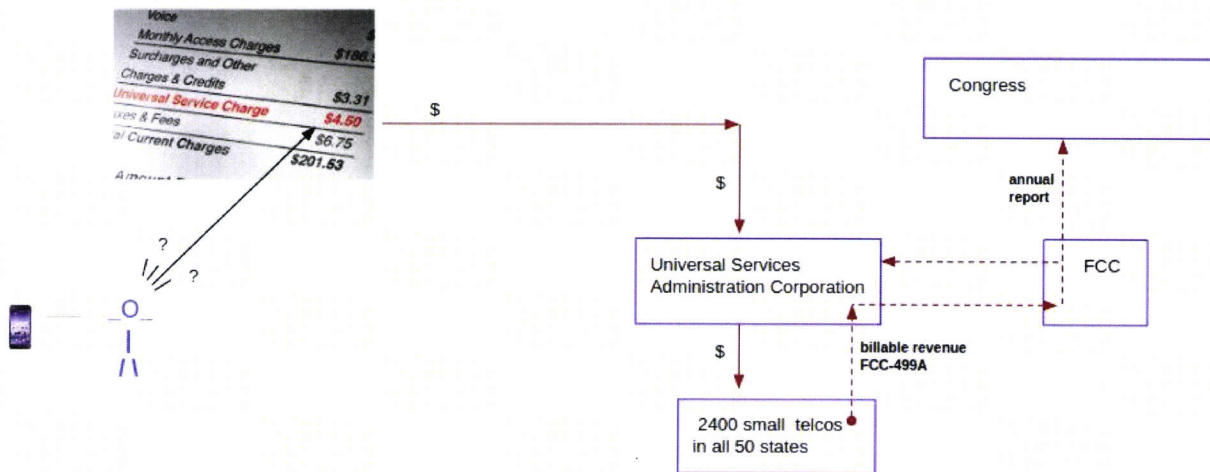
L2: The publicly stated purpose of the USF is to support the deployment of broadband technologies to rural areas of the US. The small telcos thus receive USF monies notionally because they provide modern telecommunications services to rural areas.

L3: The small telcos must report annual "billable revenue" data to the government², which the FCC then uses to determine how much USF money each small telco will receive in the next year. This revenue data is also used by the FCC in an annual report to Congress which is used to justify the continuation of the subsidy.

L4: This exhibit details wire fraud that is being committed by the large telcos in order to affect the billable revenue reported to the government. The evidence for this wire fraud comes from the plaintiff's own work materials and also from numerous publicly available sources.

L5: The central charge to (Del Signore vs Nokia)³ is that the large telcos are detuning their networks in a way that inflates the billable revenue of the small telcos, and that after the plaintiff discovered and reported evidence of this in 2009, he was blacklisted and harassed out of career.

L6: The USF monies are collected from US phone bills and paid to the Universal Services Administration Corporation, which is a corporation that is owned by the US government⁴. USAC then distributes this money to the small telcos as directed (annually) by the FCC.



² https://www.usac.org/_res/documents/cont/pdf/forms/2019/2019-FCC-Form-499A-Form-Instructions.pdf

³ Feb 2019 amended complaint:

<https://drive.google.com/open?id=1-Wdfu6g8utqpptbkV3HSPcwkZ4LpG-oO>

⁴ https://en.wikipedia.org/wiki/State-owned_enterprises_of_the_United_States

L7: This exhibit will detail evidence of wire fraud in the US cellular networks that is related to this billable revenue. In particular, evidence is detailed that shows the four large US cellular telecommunications corporations (large telcos), Verizon, AT&T, Sprint, and T-Mobile, are detuning their networks in a manner that inflates the number of cellular phone roaming operations that occur between the large and small telco's networks in order to inflate the reported billable revenue of the small telcos.

[L-8] Origin of the Universal Service Fund

The provenance of the current USF fee regime dates to the Telecommunications Act of 1996⁵, which itself was a modification to the Communications Act of 1934. From the text of the 1996 Act, one goal was (emphasis added):

“To promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and *encourage the rapid deployment of new telecommunications technologies.*”

The 1996 Act gave the FCC authority to collect the Universal Service Fee line item on US phone and cable bills in order to achieve this and other related goals. Subsequently, in a 1998 report to Congress⁶, a split FCC commission (with one dissent) outlined the planned “High Cost” subprogram of the Universal Service Fund. The USF High Cost subsidy program was then authorized with the following inconcise FCC announcement in Dec 2000:

“The Federal-State Joint Board on Universal Service adopted and released the attached Recommended Decision recommending that the Commission use the Rural Task Force’s Recommendation regarding reforms to rural high-cost universal service support mechanisms as a foundation for implementing a rural universal service plan. *Federal-State Joint Board on Universal Service*, (CC Docket No. 96-45, Released 12/22/00) FCC 00J-4”

⁵ <https://www.fcc.gov/general/telecommunications-act-1996>

⁶ https://transition.fcc.gov/Bureaus/Common_Carrier/Reports/fcc98067.pdf

L9: The FCC's USF website⁷, however, provides a relatively concise overview of the four main subprograms of the USF subsidy:

<https://www.fcc.gov/general/universal-service-fund>

About the FCC Proceedings & Actions Licensing & Databases Reports & Research News & Events For Consumers

Home Wireline

Universal Service Fund

Prior to the Telecommunications Act of 1996, the Universal Service Fund (USF) operated as a mechanism by which interstate long distance carriers were assessed to subsidize telephone service to low-income households and high-cost areas. The Communications Act of 1934 stated that all people in the United States shall have access to rapid, efficient, nationwide communications service with adequate facilities at reasonable charges.

The Telecommunications Act of 1996 expanded the traditional definition of universal service - affordable, nationwide telephone service to include among other things rural health care providers and eligible schools and libraries. Today, FCC provides universal service support through four mechanisms:

1. High Cost Support Mechanism provides support to certain qualifying telephone companies that serve high cost areas, thereby making phone service affordable for the residents of these regions.
2. Low Income Support Mechanism assists low-income customers by helping to pay for monthly telephone charges as well as connection charges to initiate telephone service.
3. Rural Health Care Support Mechanism allows rural health care providers to pay rates for telecommunications services similar to those of their urban counterparts, making telehealth services affordable.
4. Schools and Libraries Support Mechanism, popularly known as the "E-Rate," provides telecommunication services (e.g., local and long-distance calling, high-speed lines), Internet access, and internal connections (the equipment to deliver these services) to eligible schools and libraries.

L10: The wire fraud detailed in this complaint pertains to the "High Cost Support Mechanism" subprogram of the USF and all subsequent references to the "USF" refer specifically to the USF high cost program.

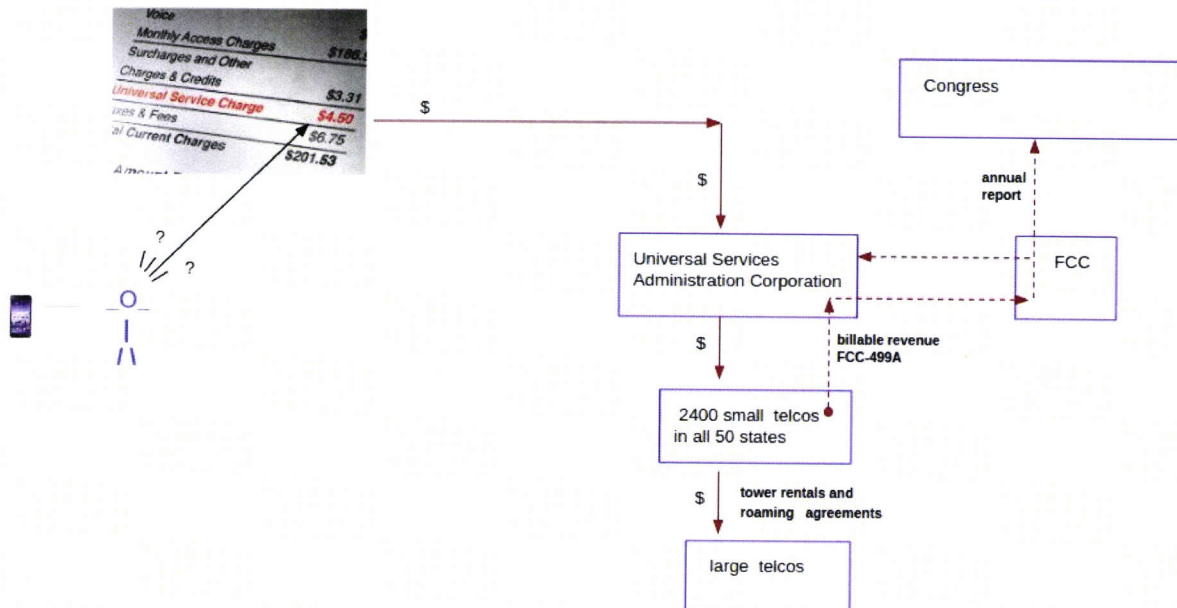
L11: The Telecommunications Act of 1996 (sec. 102) defined the eligibility requirements for the small telcos. These requirements allow the small telcos to rent usage time on the large telcos equipment:

⁷ <https://www.fcc.gov/general/universal-service-fund>

(1) **ELIGIBLE TELECOMMUNICATIONS CARRIERS**- A common carrier designated as an eligible telecommunications carrier under paragraph (2) or (3) shall be eligible to receive universal service support in accordance with section 254 and shall, throughout the service area for which the designation is received--

(A) offer the services that are supported by Federal universal service support mechanisms under section 254(c), either using its own facilities or a combination of its own facilities and resale of another carrier's services

L12: This eligibility requirement helps to elucidate why the large telcos would want to detune their networks to the benefit of the small telcos; namely that the small telcos are permitted to rent usage time on the large telcos networks and such rental agreements can be structured such that the USF money flows back to the large telcos, presumably with the small telcos each keeping their cut.

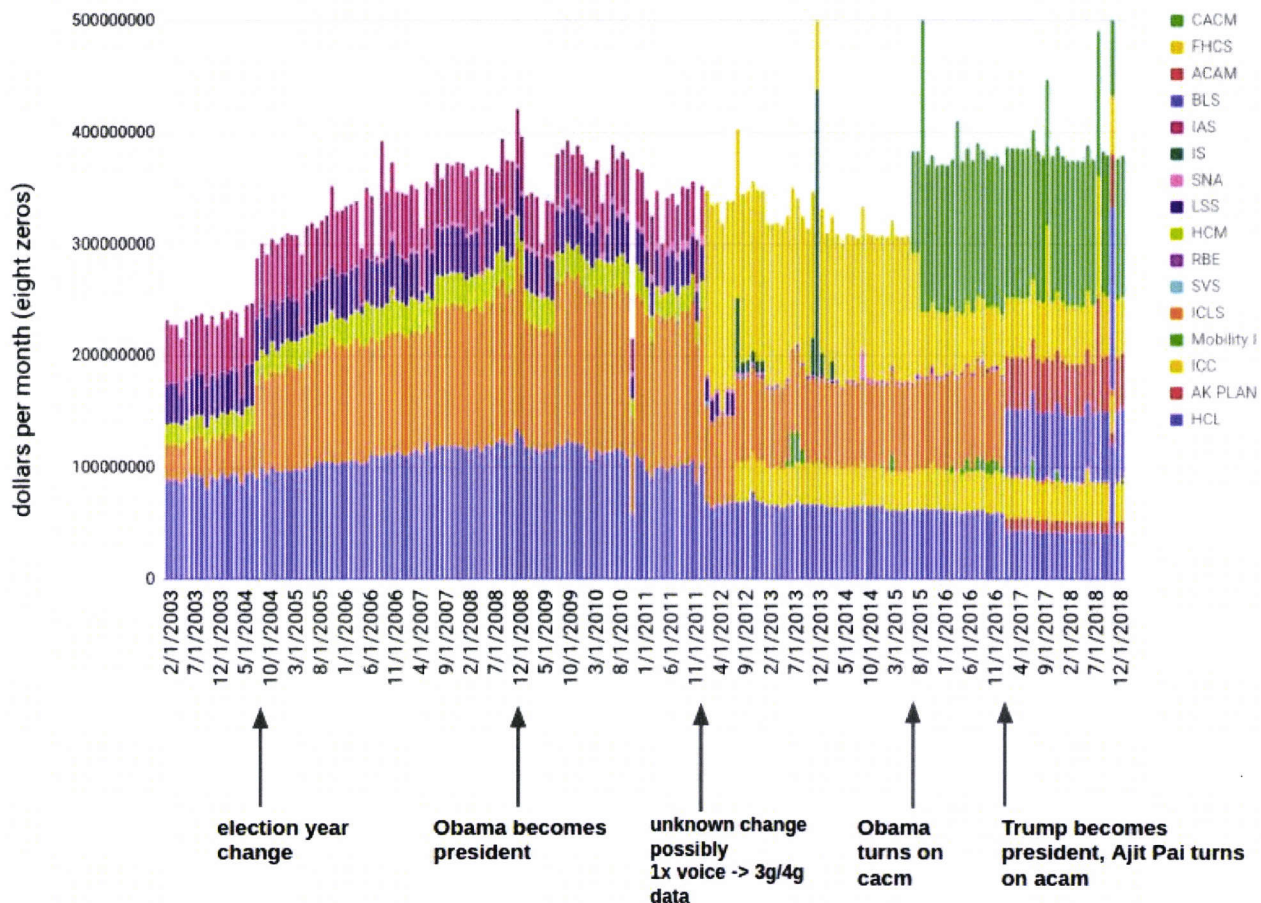


[L-13] USF payment data and political sub-structure of the USF

To our very great fortune, Congress mandated that USAC make the USF payment data publically available⁸. The data from the high cost program is published as a 270MB text file that contains monthly payment data to every USF small telco, over the entirety of the program, broken down by subprogram and US state. This data file is not immediately amenable for use in a spreadsheet; the data has been made into a form that is as verbose as possible, with 4.6M rows of data, which are randomized in time before April 2017. The short c++ program given in exhibit K⁹ was thus written and used to process the USAC datafile into the spreadsheets linked below.

L14: A plot of monthly payments by program¹⁰ shows that large changes in the funding levels of the subprograms have occurred in election years and following the two presidential transitions in 2009 and 2017.

USF high-cost-program subsidy payments 2003-2018



⁸ <https://opendata.usac.org/>

⁹ https://drive.google.com/open?id=1o-MfXkcYmFpolQpWf7XrDEYjxGbEEeeecDq6_jMhKzU

¹⁰ https://drive.google.com/open?id=1NGpfe8_IKCDUNMQpZK7MLnCcFM-t-i0rdWE8uNAuBY

L15: The first major funding change occurs in the summer of 2004 when approximately \$50 million dollars per month are added to one of the specific USF sub-program (“ICLS”) outlays. A search of FCC USF announcements¹¹ for 2004 yield no information on this change.

We next see that as soon as Obama took office, there is an immediate \$50 million dollar per month reduction to this very same sub-program. Then, approximately 10 months later, for reasons still unknown, the funding to the sub-program is restored. Another search of FCC USF announcements¹² for 2009 also yields no information on these changes.

There is an unknown change in 2011 where several programs appear to be combined.

L16: The next major change in funding level comes in 2015 when the “cacm” (connect america cost model) program is turned on by Obama¹³. After the video below was released, monthly USF outlays increase ~\$60 million dollars per month, causing everyone’s phone bill to go up by approximately a quarter.

<https://www.theverge.com/2015/1/13/7541253/obama-wants-cheaper-broadband-in-the-us>

Obama to push for cheaper, speedier broadband in the US

By Josh Lowensohn | Jan 13, 2015, 8:07pm EST

f t SHARE



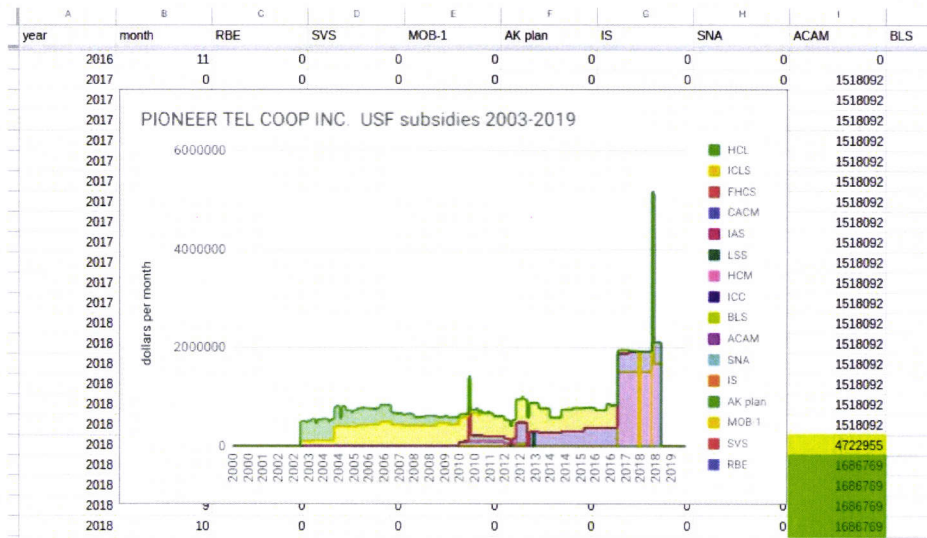
L17: Data from the USF file is presented below that shows the majority of the \$60M/month cacm increase went to a small number of states, and that within each state the increase went to only a few small telcos.

¹¹ <https://www.fcc.gov/general/universal-service-high-cost-areas-connect-america-fund>

¹² <https://www.fcc.gov/general/universal-service-high-cost-areas-connect-america-fund>

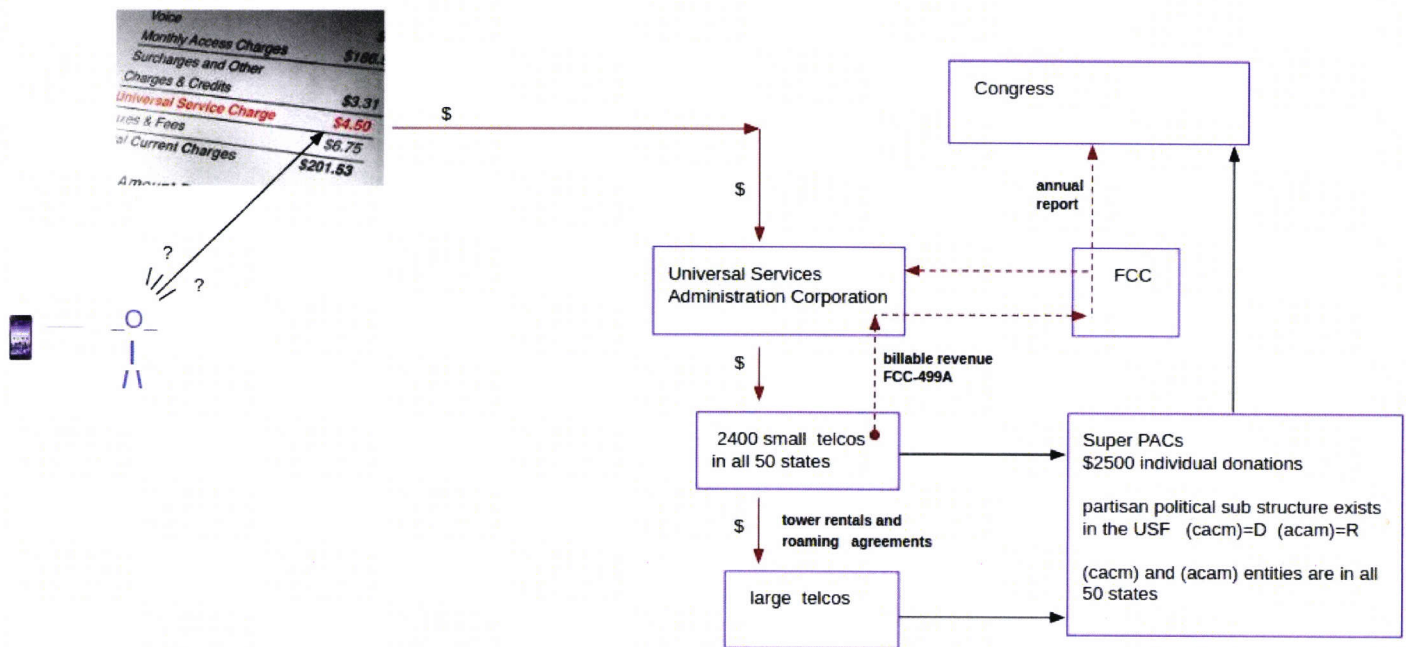
¹³ <https://www.theverge.com/2015/1/13/7541253/obama-wants-cheaper-broadband-in-the-us>
<https://www.youtube.com/watch?v=Nbol8oMNngs&t=19s>

L18: The next major change is in Jan 2017, when, due to Donald Trump's surprise victory, Ajit Pai becomes FCC chair and turns on the "acam" (alternative connect america model) program. This change immediately reorganizes the USF sub program payments as shown. The overall USF monthly funding level increases only slightly, but there are a small number of small telcos who see large increases in their monthly USF receipts, such as Pioneer Telecom in OK., as shown below:



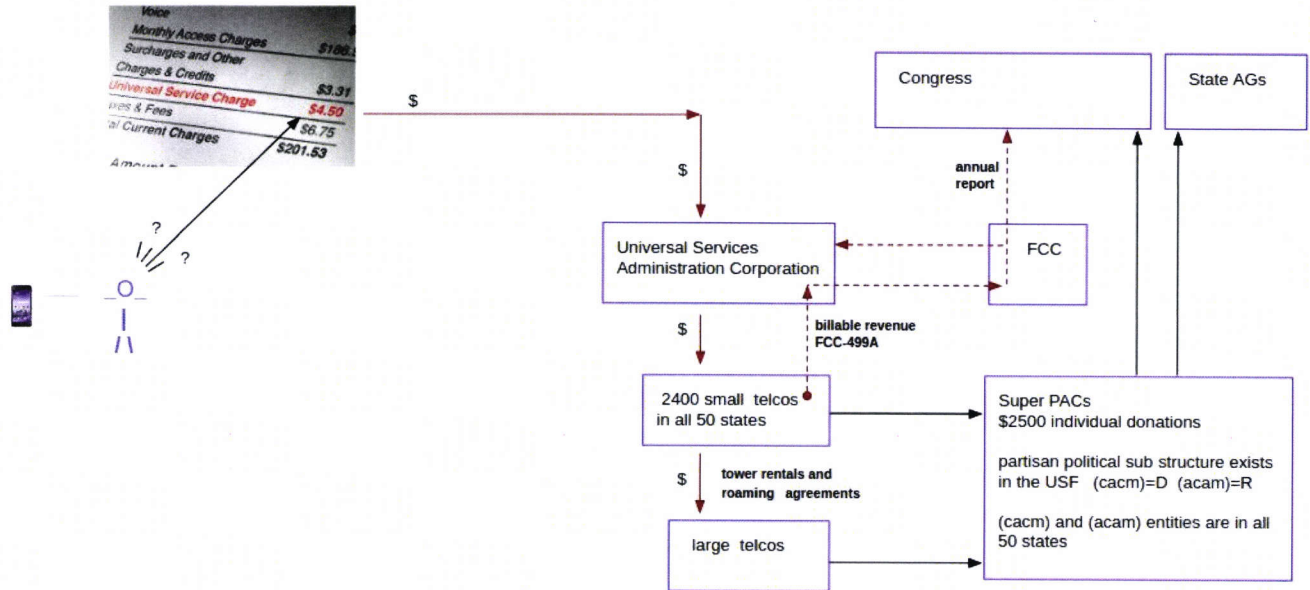
(note: Y axis is per month, six zeros)

L19: The obvious political timing and nature of these program changes then implies that both political parties are colluding with the large telcos, presumably to abscond with some fraction of the money that is collected from this subsidy.



L20: The plaintiff has also found that his home state AG (IL) has expressed a curious disinterest in this case. After submitting information related to this fraud, I was contacted by a junior council, whom I had two conversations with over a six week period. This council told me that prosecuting something like this was "out of her legislative purview". I described to her a scenario in which the state AGs could prosecute this matter as a class action lawsuit and asked if she knew who I could contact about this. She replied to me in a slow drawn out manner "Oh..... I..... wouldn't.... know... who... to.. send you to on that...". She did tell me in the second call that I should pursue this matter as a federal SOX claim through OSHA, and then ended the call emphatically with "don't call us back, we will call you if we find anything".

The USF diagram is modified thusly:



[L-21] who are the small telcos¹⁴ ?

Using Iowa as an example, a sorted list (\$/yr) of small telcos is shown¹⁵. The small telcos that receive USF money through the cacm and acam programs are noted.

L22: The largest annual recipient is "ITS - IOWA TELECOM", which receives \$28M/year. A google search reveals an association with Baring ING bank (in England), and then to Windstream Holdings (in AK).

L23: The Wikipedia entry for Windstream Holdings indicates that it has operations in 21 states and \$6B dollars in annual revenue. For comparison, the total USF subsidy pays \$14.5B annually.

			2018
IA	cacm	ITS - IOWA TELECOM	\$28,672,560
IA		UNITED STATES CELLULAR	\$24,128,328
IA	cacm	QWEST CORP-IA	\$17,893,884
IA		SOUTH SLOPE COOP TEL	\$7,833,393
IA		FARMERS MUTUAL TEL	\$4,694,211
IA	cacm	FRONTIER IOWA	\$4,240,584
IA		GRAND RIVER MUT-IA	\$4,133,229
IA		WINNEBAGO COOP ASSN	\$2,993,161
IA	acam	FARMERS MUTUAL COOP	\$2,983,557
IA	cacm	HEARTLAND TELECOMMUNICATIONS CO	\$2,923,398
IA		CLEAR LAKE INDEPEND	\$2,902,880
IA	acam	WESTERN IOWA ASSN	\$2,896,560
IA		HEART OF IOWA COMM.	\$2,789,859
IA		NORTHERN IOWA TEL CO	\$2,657,486
IA		WEBSTER-CALHOUN COOP	\$2,438,627
IA	acam	MUTUAL TEL CO	\$2,095,907
IA	acam	BUTLER-BREMER MUTUAL	\$1,955,409
IA		WEST IOWA TEL CO	\$1,721,101
IA	acam	SCHALLER TEL CO	\$1,712,089
IA	acam	PARTNER COMM. COOP.	\$1,631,370
IA		FMTC-135 INC.	\$1,617,079
IA		KALONA COOP TEL CO	\$1,508,239
IA	acam	NORTHEAST IOWA TEL	\$1,483,684
IA		GRISWOLD CO-OP TEL	\$1,475,069
IA		MEDIAPOLIS TEL CO	\$1,467,588
IA		VILLISCA FARMERS TEL	\$1,309,431
IA	acam	VAN BUREN TEL CO	\$1,295,963
IA		WEST LIBERTY TEL CO	\$1,295,195
IA	acam	COOPERATIVE TEL CO	\$1,292,705
IA		LA PORTE CITY TEL CO	\$1,283,971
IA		ALPINE COMM.	\$1,256,472
IA		CITIZENS MUTUAL TEL	\$1,223,321
IA		HILLS TEL CO INC-IA	\$1,188,937
IA		OGDEN TEL CO - IA	\$1,152,043
IA	acam	NORTHWEST TEL COOP	\$1,125,004
IA		MARNE & ELK HORN TEL	\$1,093,369
IA	acam	MODERN COOP TEL CO	\$1,081,110
IA	acam	COON VALLEY COOP TEL	\$1,046,616
IA		BERNARD TEL CO INC	\$1,040,115
IA		PANORA COMM COOP	\$1,027,407
IA		PRESTON TEL CO	\$1,025,971
IA		ACE TEL ASSN-IA	\$1,008,474
IA		LEHIGH VALLEY COOP	\$1,000,750
IA	acam	NORTHWEST IOWA TEL	\$983,617
IA		KEYSTONE FRMS COOP	\$981,617
IA		CASCADE COMM. CO.	\$977,358

Iowa Telecom

From Wikipedia, the free encyclopedia

Iowa Telecommunications Services, Inc., commonly known as **Iowa Telecom**, provided local telephone service to former GTE customers in the U.S. states of Iowa, Missouri, Illinois, and Minnesota. Iowa Telecom was founded in 1999 as a partnership between **Iowa Network Services** and **ING Barings**. It acquired the assets of **GTE Midwest**, which served Iowa following Bell Atlantic's purchase of GTE. It had 257,700 access lines and served 435 communities in Iowa. ^{[when?]^[citation needed]}

In 2002 Iowa Telecom bought PC Partner Communications and Zumatel Communications.

On February 7, 2008, Iowa Telecom bought Lakedale Communications, Sherbtel Communications, Connections-ETC, and SOMA, all located in Minnesota. At that time it also acquired Willinet in New York.

On November 24, 2009 Iowa Telecom was acquired by **Windstream**.^[1]

Its telephone directories were published by **Pinnacle Publishing**.

Windstream Holdings

From Wikipedia, the free encyclopedia
(Redirected from **Windstream**)

Windstream Holdings, Inc., also doing business as **Windstream Communications** or **Windstream**, is a provider of voice and data network communications (**broadband**, **VoIP**, **MPLS**), and managed services (**virtual servers**, managed firewall, data storage, cloud-based voice, etc.), to businesses in the United States.^[4] The company also offers residential broadband, phone and digital TV services to consumers within its coverage area. It is the ninth largest residential telephone provider in the country^[5] with service covering more than 8.1 million people in 21 states.^[6] Headquartered in **Little Rock, Arkansas**, Windstream has more than \$6 billion in annual revenues.

The company was formed in 2006, when **Alltel's** local telephone service merged with **Valor Communications Group** out of part of **GTE** (now part of **Verizon's**) local telephone business in the Southwestern United States.

Windstream is a partner with **Direct TV**, offering satellite service to its customers.


¹⁴ <http://apps.fcc.gov/cgb/form499/499a.cfm>

¹⁵ https://drive.google.com/open?id=1xh41jkOEQcxR_K6Z_CNdD3JRcW1_dhliiWYHNfs6yAw

L24: At the bottom of the list, it appears that there are entities that have begun submitting FCC-499 forms but do not yet have any KPIs in Iowa.

		2018	2017	2016	2015	2014	2013	2012
IA	BARNES CITY COOPERATIVE TELEPHONE COMPANY	\$2,573	3444	3444	3444	3444	3767	4928
IA	OGDEN TELEPHONE COMPANY	\$2,304	3084	3084	3084	3078	3665	3174
IA	ALGONA MUNICIPAL UTILITIES	\$1,848	1848	1848	1848	1839	2131	2795
IA	OSAGE MUNICIPAL TELECOMMUNICATIONS UTILITY	\$1,284	1284	1284	1284	1281	1477	1917
IA	GOLDFIELD ACCESS NETWORK	\$1,020	1020	1020	1020	1017	1175	1543
IA	ALTA MUNICIPAL UTILITIES	\$552	552	552	552	552	633	822
IA	DIXON TELEPHONE COMPANY	\$110	120	120	120	120	127	382
IA	PREMIER COMMUNICATIONS INC.	\$108	108	108	108	108	120	168
IA	HAMILTON COUNTY WIRELESS	\$90	120	120	120	120	136	192
IA	WEBSTER-CALHOUN COOPERATIVE TELEPHONE ASSOC	\$62	84	84	84	84	104	124
IA	SAGE TELECOM COMMUNICATIONS DBA TRUCONNECT	\$0	0					
IA	STS MEDIA DBA FREEDOMPOP	\$0	0	0				
IA	TAG MOBILE LLC	\$0	0	0	0			
IA	TEMPO TELECOM LLC	\$0	0	0	0	0		
IA	TOTAL CALL MOBILE INC	\$0	0	0	0	0		
IA	I-WIRELESS DBA ACCESS WIRELESS	\$0	0	0	0	0	0	
IA	NET MOBILE LLC	\$0	66252	73164	73164	72942	22335	
IA	Q LINK WIRELESS LLC	\$0	0	0	0	0	0	
IA	TELRITE CORPORATION DBA LIFE WIRELESS	\$0	0	0	0	0	0	
IA	GLOBAL CONNECTION OF AMERICA DBA STAND UP WIRE	\$0	0	0	0	0	0	
IA	UNITED STATES CELLULAR CORPORATION	\$0	0	1065132	0	0	546165	
IA	BOOMERANG WIRELESS LLC	\$0	0	0	0	0	0	0
IA	BUDGET PREPAY INC DBA BUDGET PHONE	\$0	0	0	0	0	0	0
IA	HOSPERS TELEPHONE EXCHANGE INC DBA HTC COMM	\$0	0	0	0	0	0	0

https://www.truconnect.com/news-media/truconnect_is_now_one_of_the_fastest_growing_wireless_companies_in_the_united_states



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TruConnect Is Now One of the Fastest Growing Wireless Companies in the United States

Emerging wireless provider brings innovation to expanding underserved customer base

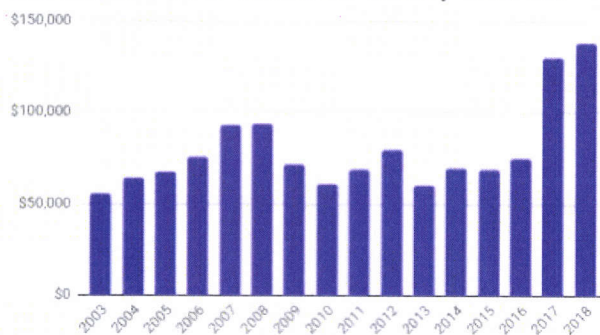
Dallas, Texas, April 29, 2015—TruConnect, a rising brand among U.S. wireless companies, has emerged as one of the fastest growing wireless companies in the United States according to data from the Universal Service Administrative Company. The company has grown more than 300 percent in the past 12 months by focusing on the underserved market to provide affordable solutions to wireless Pay As You Go, Lifeline and mobile

"broadband investment" by the small telcos

L25: The Barnes City Telephone Coop¹⁶ is a good example. This small telco is the lowest paid acam small telco in Iowa; its USF subsidy approximately doubled to \$140K/yr after Ajit Pai turned on the acam program in Jan 2017.

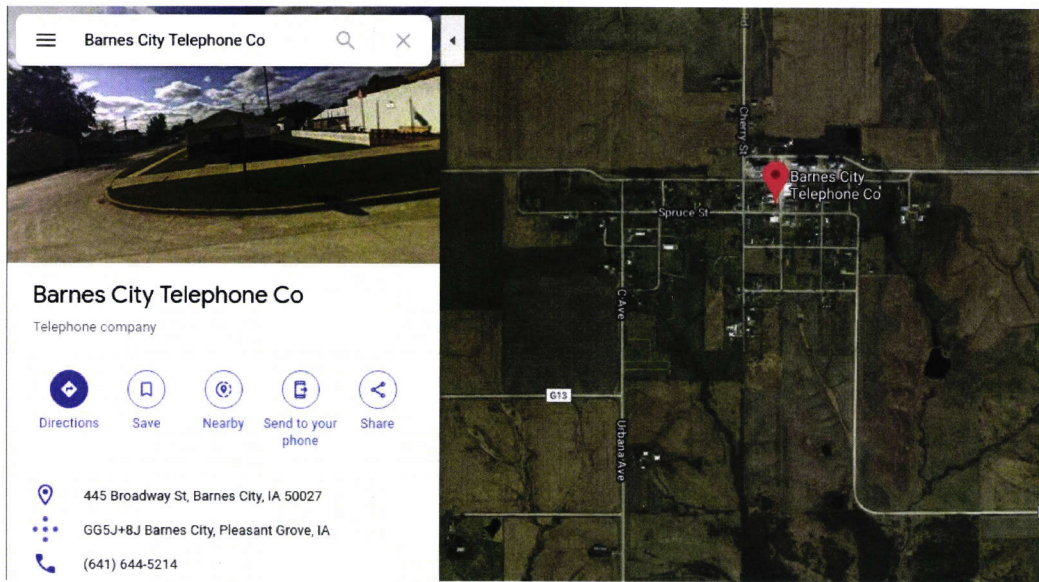
		2018	2017	2016	2015
IA	FARMERS TEL CO - BAT	\$158,883	145810	142140	129470
IA	acam FENTON CO-OP TEL CO	\$154,458	160235	155079	150836
IA	FMTC WIRELESS	\$149,929	200652	200652	200652
IA	SOUTH SLOPE COOPERATIVE	\$148,756	199080	199080	199080
IA	ALLAMAKEE-CLAYTON ELECTRIC COOPERATIVE INC	\$145,344	145344	145344	72673
IA	acam BARNES CITY COOP	\$138,349	130090	75123	69008
IA	PRAIRIEBURG TEL CO				595
IA	REASNOR TELEPHONE COMPANY				962
IA	SKYLINK LC				716
IA	VAN BUREN WIRELESS COMPANY				116
IA	KCTC PCS				804
IA	IOWA RSA NO. 2 LIMITED PARTNER				060
IA	FARMERS (MANILLA)				135
IA	CLAY COUNTY COMMUNICATIONS				572
IA	COMMUNITY CABLE TELEVISION C				104
IA	EAST BUCHANAN TELEPHONE CO				816
IA	MAC WIRELESS LLC				896
IA	FARMERS (DEFIANCE)				486
IA	ROCKWELL COOPERATIVE TELEPH				524
IA	THE BURT TEL CO				617
IA	C-M-L TEL COOPERATIVE ASSN				004
IA	WESTSIDE INDEPENDENT	\$52,236	41280	143721	142584
IA	CCM WIRELESS INC.	\$50,545	67644	67644	67644
IA	BERNARD COMMUNICATIONS INC.	\$49,844	66708	66708	66708

BARNES CITY COOP annual USF subsidy 2003-218

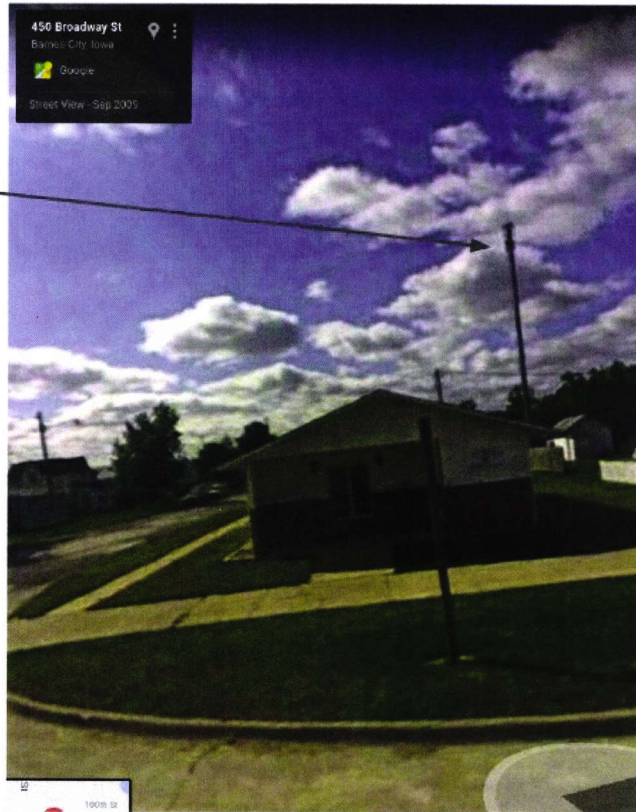


Barnes City Iowa is a small farming town 80 miles east of Des Moines and approximately 20 miles south of the nearest I-80 interchange.

¹⁶ <http://apps.fcc.gov/cgb/form499/499detail.cfm?FilerNum=809238>



likely a
"small cell"



L26: The small telcos are required to own some of the equipment that is used to deliver subsidized telecommunications services. Ownership of a single "small cell" would satisfy this requirement. The small telco would then presumably be free to rent network elements (such as along the nearby state highways) from the large telcos in order to increase their subsidy receipts.

L27: A short google search of "Barnes City Telephone" leads to the following FCC document¹⁷, which details a series of associations with larger entities, eventually leading through a company called "iWireless" and then to Deutsche Bank and T-Mobile.

FCC FORM 608
EXHIBIT A
Page 1 of 3

DESCRIPTION OF LEASE AND PUBLIC INTEREST STATEMENT

Barnes City Cooperative Telephone Company ("Barnes City Cooperative") and Iowa Wireless Services Holding Corporation ("IWSHC") (collectively, the "Parties") hereby notify the Commission that they have entered into a short-term spectrum manager lease from Barnes City Cooperative to IWSHC of the following Personal Communications Services ("PCS") spectrum (the "Leased Spectrum"):

Call Sign	Licensee	Lessor	Underlying Market	Leased Areas	Service/Block (MHz)
WPTJ815	Barnes City Cooperative Telephone Company	IWSHC	MTA032 – Des Moines-Quad Cities (Submarket 252)	Entire licensed area	Entire licensed spectrum

By way of background, IWSHC and its parent, Iowa Wireless Services, LLC ("Iowa Wireless"), were formed for the purpose of providing advanced wireless telecommunications services in Iowa.¹ IWSHC is an FCC licensee that already holds and operates a network on several PCS and AWS licenses in the markets centered around Iowa. The company has a demonstrated track record of providing broadband PCS and AWS services to historically underserved rural areas by providing high quality and innovative wireless telecommunications and data services directly to subscribers, or through a network of independent telephone companies operating under a common brand name, i.e., "iWireless." IWSHC is thus well-qualified and well-positioned to utilize the Leased Spectrum.

IWSHC is a wholly owned subsidiary of Iowa Wireless Services, LLC, which is comprised of two members: INS Wireless, Inc. (a wholly owned subsidiary of Applicant Iowa Network Services, Inc.), and VoiceStream PCS I Iowa Corporation ("VoiceStream PCS"). Deutsche Telekom AG ("DT"), a German company, holds an indirect foreign ownership interest in Iowa Wireless Services, LLC, and its affiliate, IWSHC. Through a series of intermediate subsidiaries, DT holds a 100% ownership interest in T-Mobile USA, Inc. (f/k/a VoiceStream Wireless Corporation) ("T-Mobile USA"). T-Mobile USA indirectly holds a 100% ownership interest in T-Mobile and VoiceStream PCS. DT is authorized by the Commission to hold up to and including a 60% indirect ownership interest in IWSHC.²

¹⁷

<https://wireless2.fcc.gov/UlsEntry/attachments/attachmentViewRD.jsp?applType=search&fileKey=97842648&attachmentKey=20253457&attachmentInd=applAttach>

[L-28] how the early wire fraud works

The small telcos are required to provide “telecommunications services” in qualifying areas and then to convert counts of these services into a billable revenue dollar amount which is reported annually to USAC on their FCC-499 form¹⁸.

USAC administers random audits to 5% of the small telcos per year to verify that their reported billable revenue corresponds to actual counts of telecommunications operations that occurred in their networks (unknown conversion factor). Such operational counts are generated by cellular switching systems and typically referred to as KPIs (key performance indicators).

L29: In cellular networks, there are three types of mobile phone operations that could be readily be categorized as a “telecommunications service” and converted to billable revenue.

registration
connections
roaming

Cellular phones register for service with the overlaying network when first powered on or when entering a new registration area. Once registered, they can make connections to the network to transfer voice or data. While in the connected state they can also use roaming functions to transfer the connection to another tower or a different sector on the same tower.

L30: In theory, it would be possible to use any of these three operations to generate a regime of billable revenues that could be used by all the small telcos nationwide. However there could be considerable complexity in any regime and it would be desirable to make the regime(s) as simple as possible.

L31: Based on the harassment incidents around the Plaintiff’s attempts to change the “t_drop_int” parameter in 2010 and 2015 (paragraphs 36A and 47 in complaint), it appears that roaming operations were being used at those times¹⁹ to generate billable revenue using the KPI counts from the 1X voice and 3G data systems²⁰.

¹⁸ https://www.usac.org/_res/documents/cont/pdf/forms/2019/2019-FCC-Form-499A-Form-Instructions.pdf

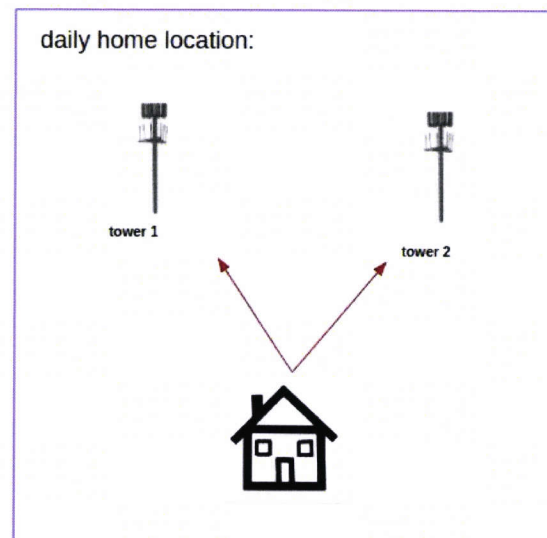
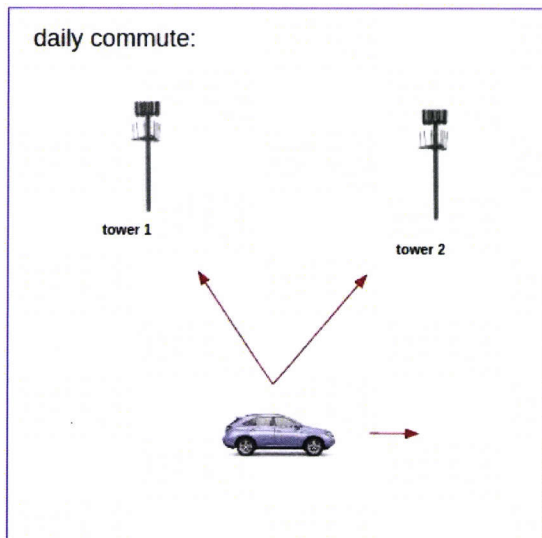
¹⁹ Additionally I have recalled conversations I had with Dave Rossetti on the t_drop_int parameter in which I recall him telling me that it was set to its current value sometime in the early 2000s.

²⁰ the 1X reverse link (phone to tower) signalling interface was reused in the 3G EVDO system. All of the technical details given pertain to both systems.

2019 Instructions to the Telecommunications Reporting Worksheet, FCC Form 499-A

Category of Revenue	Report on
Per-minute switched access charges and reciprocal compensation	Line 304
Revenues received from carriers as payphone compensation for originating toll calls	Line 306
Charges for physical collocation of equipment pursuant to 47 U.S.C. § 251(c)(6)	Line 307
Revenues that filers receive as universal service support from either states or the federal government	Line 308
Revenues received from another U.S. carrier for roaming service provided to customers of that carrier	Line 309

L32: Notionally, a roaming operation between a large telco and a small telco implies that a cell phone user is in motion and has crossed between two service areas. However this is not the only scenario that will generate roaming operations. In 2009, what I found was that stationary users that are in RF contact with two towers, or two cells on the same tower, were producing approximately half of all 3G roaming operations in the Verizon network, nationwide.

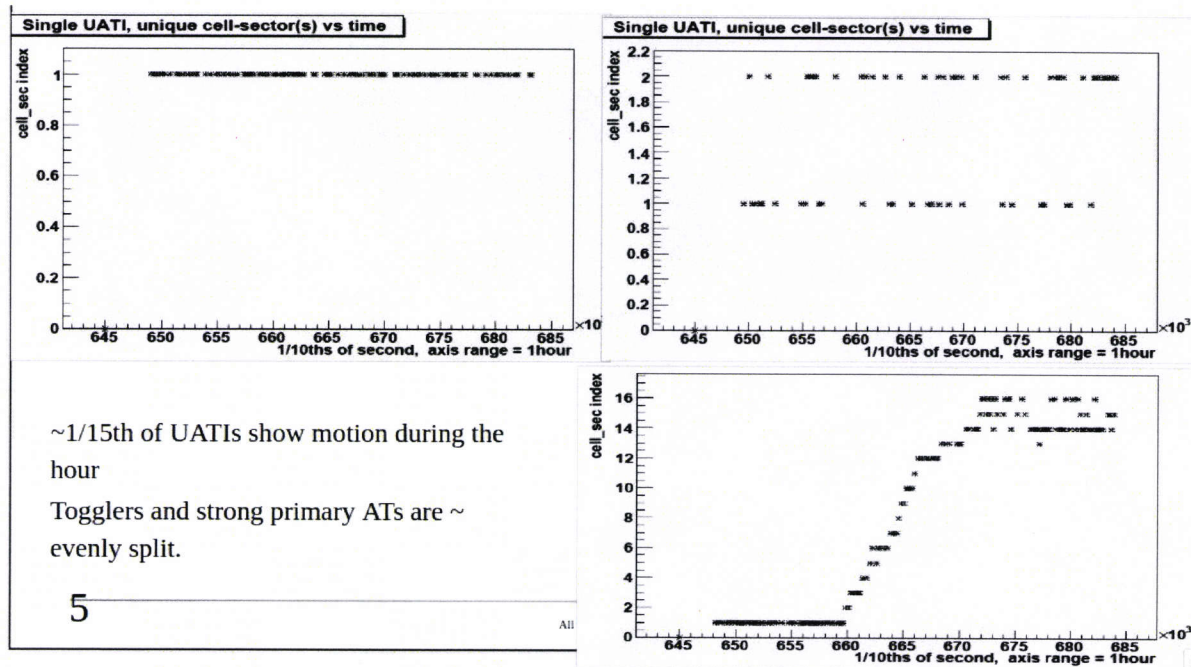


In approximately 60% of all connections made, the phone is in the signal path of two or more network elements, such as two towers (~33%) or two sectors on the same tower (~66%).

L33: If the signal strength of the individual network elements is approximately equal, the phone will exhibit a phenomena referred to as “toggling”, as shown below (upper right).

By analyzing 3G per call measurement data, I was able to identify moving users and to estimate the fraction of roaming operations that were due to moving versus stationary cell phones.

(“cell phone” = “UATI” or “AT” in the 3g nomenclature below)



L34: The plots above show data from three individual phones, taken over a 1 hour period. Each point is generated when the phone made a data connection to the 3G network. The Y axis represents an index into a running list of unique network elements that the mobile has used to start connections on during the hour (the mobile uses the strongest received signal to start the connection).

L35: In the upper left, the phone always starts on the same network element. In the upper right, the phone starts randomly on either of two network elements. In the lower right, the phone is initially stationary with a strong primary, and then begins to move and traverses ~16 network elements and then stops moving. After the phone stops, it is toggling between 3-4 network elements.

L36: The toggling phenomena also occurs while the phone is in the connected state and cause roaming operations to be initiated, which can lead to the phone dropping and then re-adding the network elements (randomly).

L37: The data below shows a packet capture of a stationary phone that is toggling and dropping and re-adding a network element. This data was given to me by Steve Sommars in approximately 2008 after he had observed the toggling phenomena in a live field site.

Packet capture of an AT adding/dropping a single leg

```

channel RUM - two pilots, PN 16,292; ecio=-2.5,-9)
28030 0x9840fd05 ACPI 10.220.74.206 10.204.38.10 ACPIRUM 292 18 1 0 (PN=292, ecio=18/-2, keep=1)
28030 0x9840fd05 ACPI 10.220.74.206 10.204.38.10 ACPIRUMRef 16 5 1 (PN=16, ecio=-2.5, keep=1)

s set up)
28567 0x9840fd05 ATReq 10.204.38.10 10.220.74.206 750 16 10.204.38.17
28571 0x9840fd05 ATReq 10.204.38.10 10.220.75.14 750 292 10.204.38.17
29491 0x9840fd05 ATRes 10.220.75.14 10.204.38.10 750 292 Success
29497 0x9840fd05 ATRes 10.220.74.206 10.204.38.10 750 16 Success

affic channel RUM @ .3sec)
56654 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 1 norlpseqno BearerRumRef 16 9 1
56654 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 BEARERUM 292 9 1 0

RUM, keep =0 for both legs)
55149 0x9840fd05 ReversePkt 10.220.75.14 10.204.38.17 1 norlpseqno BearerRumRef 292 14 0
55149 0x9840fd05 ReversePkt 10.220.75.14 10.204.38.17 BEARERUM 16 4 0 0

RUM, this one drops PN 292)
55163 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 1 norlpseqno BearerRumRef 292 14 0
55163 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 BEARERUM 16 4 0 0
62740 0x9840fd05 DeaTC 10.204.38.10 10.220.75.14 750 292 0

RUM, this one adds 292 back .5 seconds later)
04549 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 1 norlpseqno BearerRumRef 16 9 1
04549 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 BEARERUM 292 10 1 0
04791 0x9840fd05 ATReq 10.204.38.10 10.220.75.14 750 292 10.204.38.17
06666 0x9840fd05 ATRes 10.220.75.14 10.204.38.10 750 292 Success

something?)
19132 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 1 norlpseqno BearerRumRef 16 6 0
19132 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 BEARERUM 292 14 0 0

34596 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 1 norlpseqno BearerRumRef 16 5 0
34596 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 BEARERUM 292 19 1 0

, 7 seconds after it was dropped)
95131 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 1 norlpseqno BearerRumRef 16 8 0
95131 0x9840fd05 ReversePkt 10.220.74.206 10.204.38.17 BEARERUM 292 22 0 0

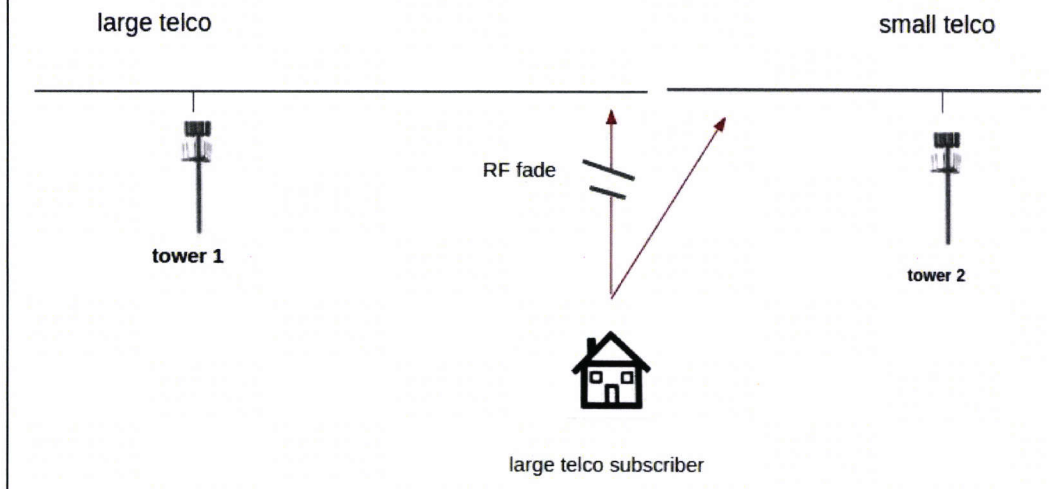
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L38: With the current value of t_drop_int , when averaged over a day, there will be a roughly constant fraction of calls that toggle to the small telcos network and then drop the connection to the large telco's network.

single band toggling:

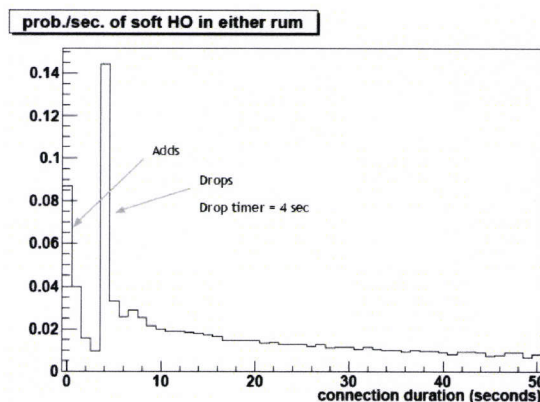
- the stationary phone will begin all connections on the large telco's network element, but it will also include all other network elements it can see in what is known as the "active set".
- RF fading occurs randomly between all network elements and can cause the phone to drop the large telco's network element, in which case the small telco is serving the connection exclusively.



L39: When viewed in isolation, this stationary toggling scenario would be indiscernible from a phone that is traveling between two service areas and the associated KPIs could be argued to be valid as a USF billable revenue.

L40: The proposal I made in 2010 to change t_{drop_int} to -13dB would have eliminated most of these stationary roaming events, nationwide. The spike at $x=4$ sec (below) would have been eliminated.

PCMD data shows spikes in RL SHO add/drops at 1 and 4 seconds.



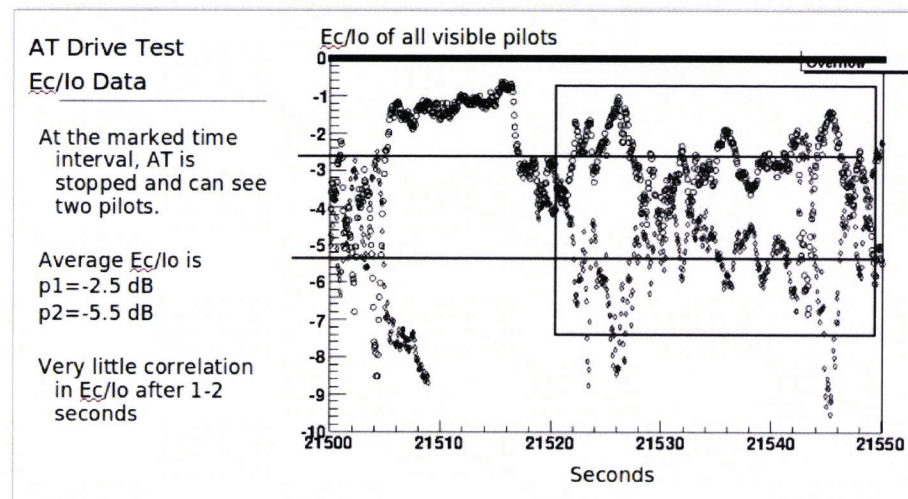
Approx. 50% of RL SHO recorded in PCMD are in the 1st or 4th second of the connection.

RL SHO consumes ~20% of AP PO (relative)

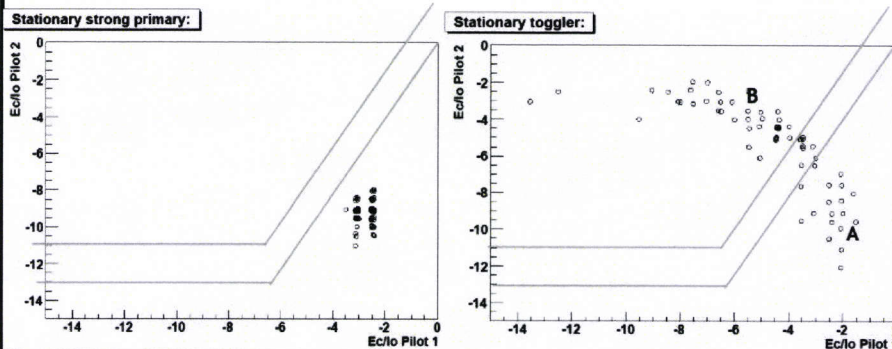
L41: In 2010, at the time of the $t_{\text{drop_int}}$ parameter trial, there was rapid growth (~5%/month) in 3G network utilization due to users upgrading from non-smartphones to smartphones and many of the large telco's switching systems were being run at near or over their rated capacity. To meet this growth, Alcatel-Lucent was producing and installing 3G switching systems as fast as possible, with some manufacturing facilities running three shifts.

L42: These excess roaming operations were estimated to be adding a 10% capacity degradation to the "switching servers" of the ALU 3G EVDO systems in use by the large telcos at the time. The capacity of the switching servers was the performance limiting constraint of the 3G systems, thus by adopting my $t_{\text{drop_int}}$ parameter change, the nationwide capacity of the ALU 3G EVDO systems would have increased by approximately 10%.

Drive test data from a single phone. E_c/I_o (S/S+N) vs time for all visible pilots. Measurement rate is 10 per second.



Pilot 1 vs Pilot 2 for stationary ATs, RUM1, all points in hour.



At connection setup, soft slope is not used, so P1 and P2 both go into active set (if reported in CR RUM).

For toggling AT:

If P2 fades out (A) for 4 seconds, it is dropped. It has to wait for P1 to fade out to get above the soft slope (B) before it can get back into active set.

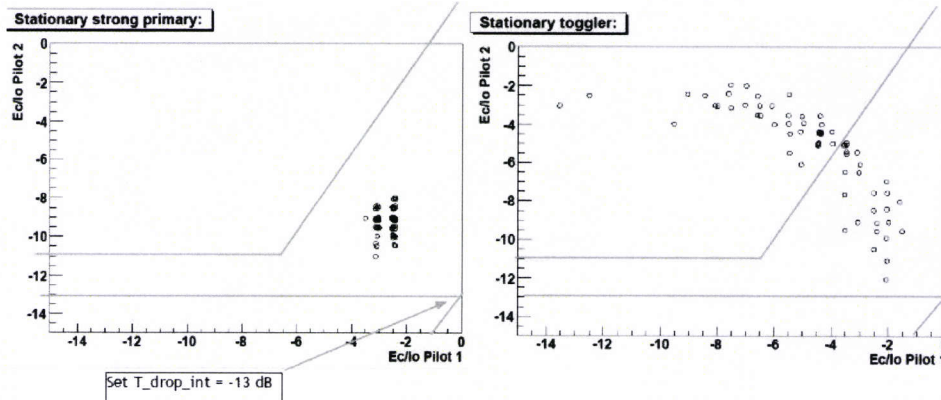
11

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L43: changing $t_{\text{drop_int}}$ (as shown below) would have reduced the number of roaming operations by eliminating the stationary togglers from the relevant KPIs.

Proposed change: Set $T_{\text{drop_int}} = -13\text{dB}$



This will make it harder to drop a leg from the active set.

- MACID Erlangs will go up, but RSSI should not.
- For moving ATs, pilots will eventually weaken below -13dB and drop.
- For stationary togglers, presumably it would be better to keep both pilots at all times (RL fading should not be correlated with FL fading)
- For stationary ATs with a strong primary, we will keep an unnecessary weak pilot in active set. (SHO drop @ .3sec may be no more expensive than normal drop @ con end)

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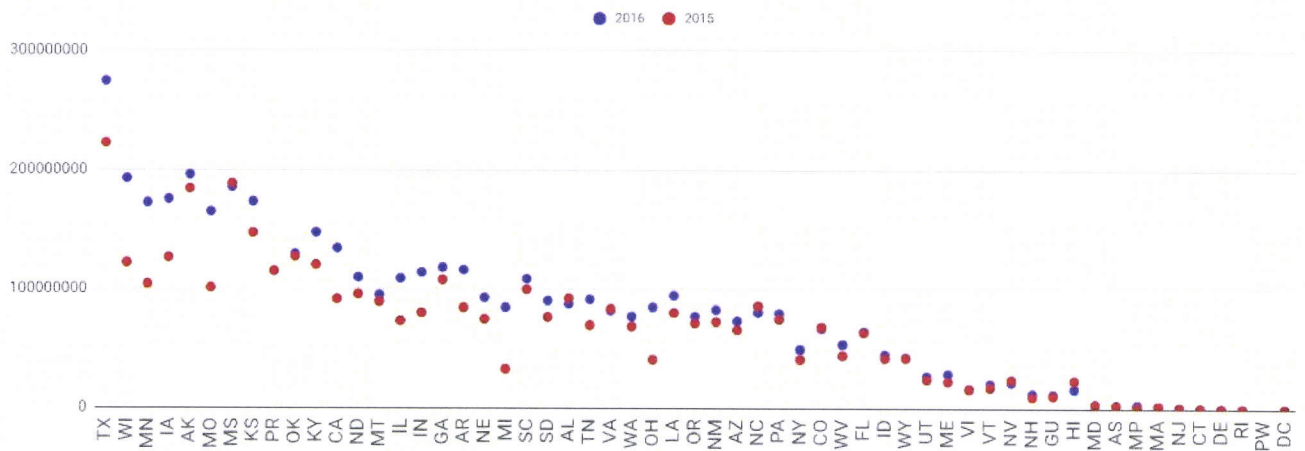
L44: The Sprint 3G only network that has not been upgraded is likely generating USF billable revenue roaming operations for small telcos that have not upgraded to 4G equipment either.

[L-45] how the later wire fraud(s) work

When the democrats turned on the cacm program in 2015, USF payments went up by ~\$60M / month nationwide.

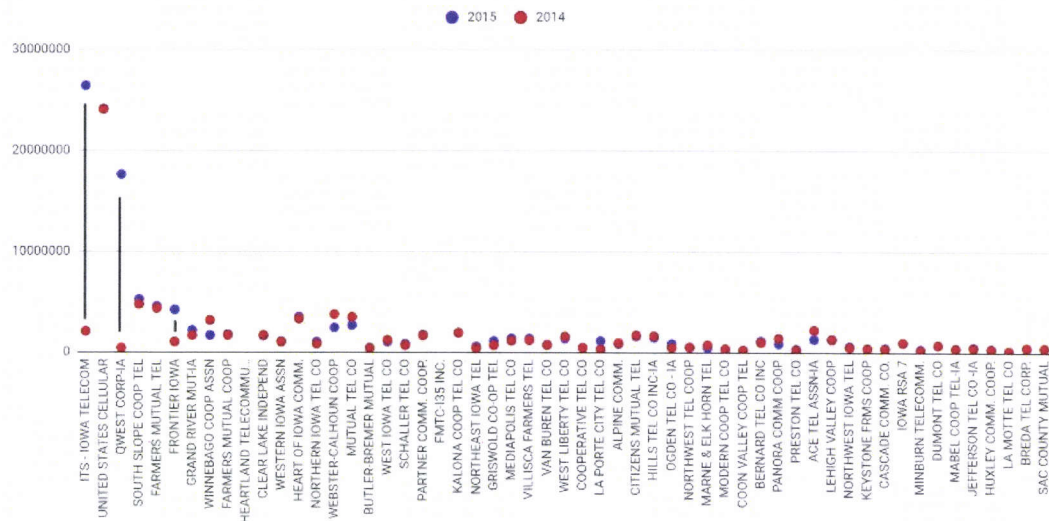
Most of the increase went to seven states, TX, WI, MN, IA, MO, MI, and OH, that each received ~\$5M / month increases. KS, CA, IL, and ID also saw ~\$2M+ / month increases.

US states, cacm winners and non winners



(Y axis = dollars per year, 8 zeros)

Using Iowa as an example: Iowa received a ~\$50M / yr increase, the majority of which went to only three small telcos²¹:

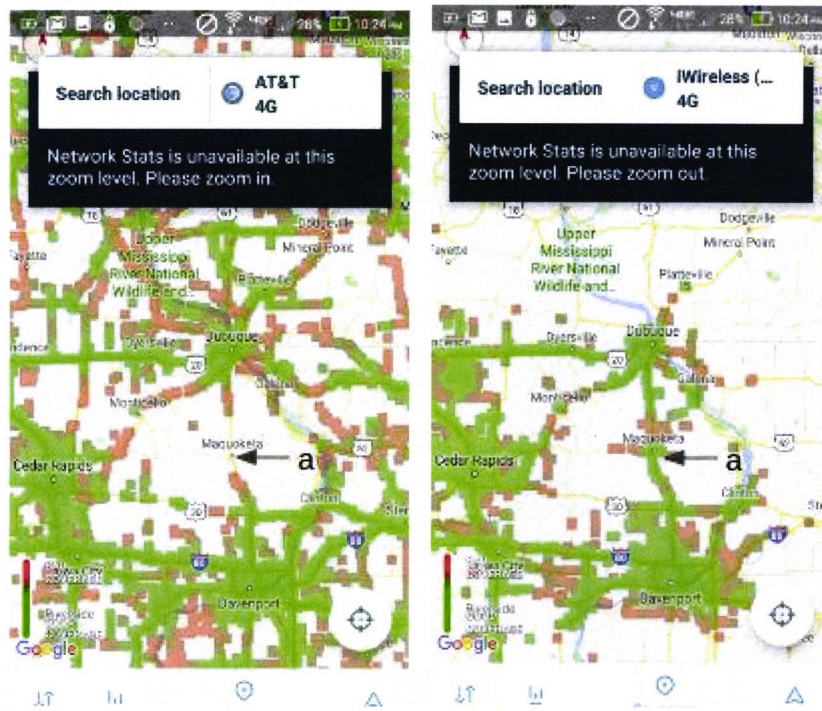


(Y= dollars per year, 7 zeros)

The three cacm small telcos above that got large sudden increases would have presumably needed large sudden increases to the number of “telecommunications services” that they provide.

²¹ https://drive.google.com/open?id=1xh41jkOECqxR_K6Z_CNgD3JRcW1_dhliiWYHNfs6yAw

dead spots on highways in the AT&T network in Iowa with small telco iWireless filling the gap:



Map of USF MF-II eligible areas for this same area:



L46: The complaint and exhibit J have further examples, however, as detailed below, the heatmap tool has been de-tuned as of July 2019 such that the gaps are significantly harder to discern.

L47: All of the AT&T subscribers that drive on that highway (either direction) will be forced to roam to one of the other providers. This would have the effect of inflating the roaming counts and billable revenue of the small telco "iWireless".

L48: This mechanism would presumably use the raw number of connections made by the captive AT&T roamers while they transited the gap. Smartphones average approximately 10 data connections per hour (mostly autonomous) and these KPIs could be used by the small telcos as a basis for reported revenue to USAC.

L49: Such a dead spot could have been turned on at any time. Presumably it would have been turned on at the 2015 cacm program funding change so that the USAC audits would not fail.

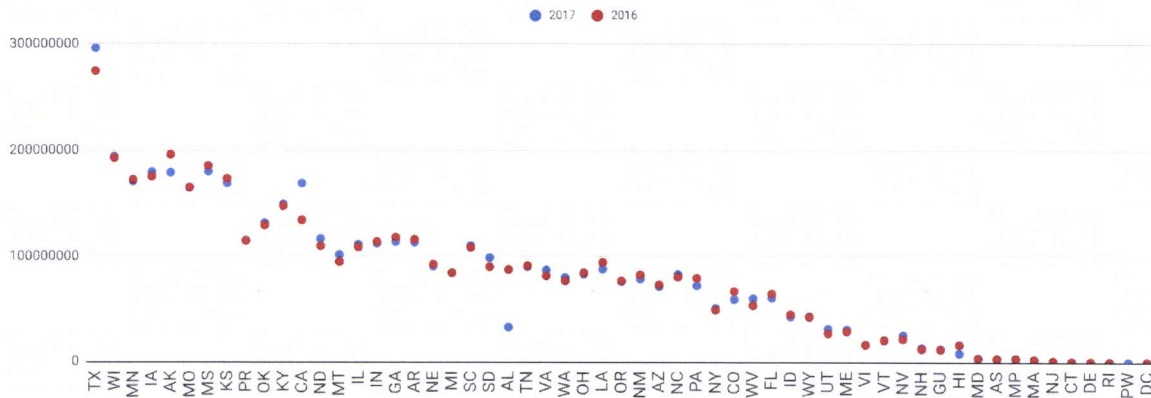
L50: There is a software feature in the 3G networks called "distance based handoff". The feature worked by sending the phone a distance parameter which it would use as a threshold to initiate a roaming operation to another network element. This design may sound sensible to a non expert, but to me it makes no sense. There was never a reason during the 20 year span of 1X voice to develop such a roaming feature. All roaming decisions have been based on signal strength in 1X and 3G prior to this feature.

L51: The most plausible explanation for this feature is that it is used as part of the USF wire fraud. The highway gaps above could be made using a similar such 4G function.

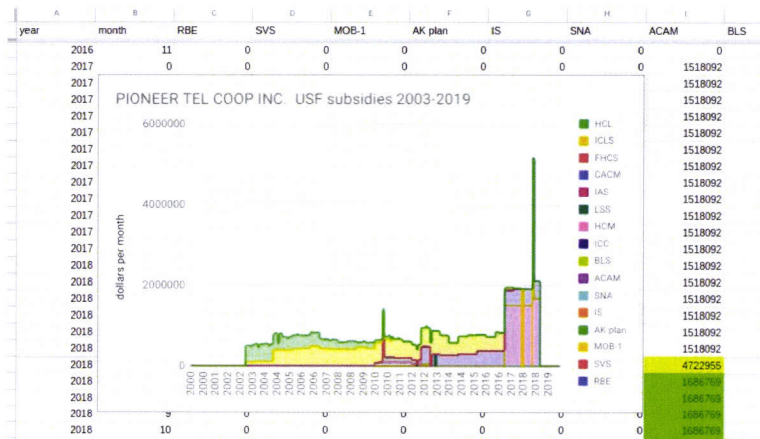
[L-52] Trump's surprise victory and the start of the acam program

The state level funding changes after the acam program was turned on in Jan 2017 are shown - 8 zeros.

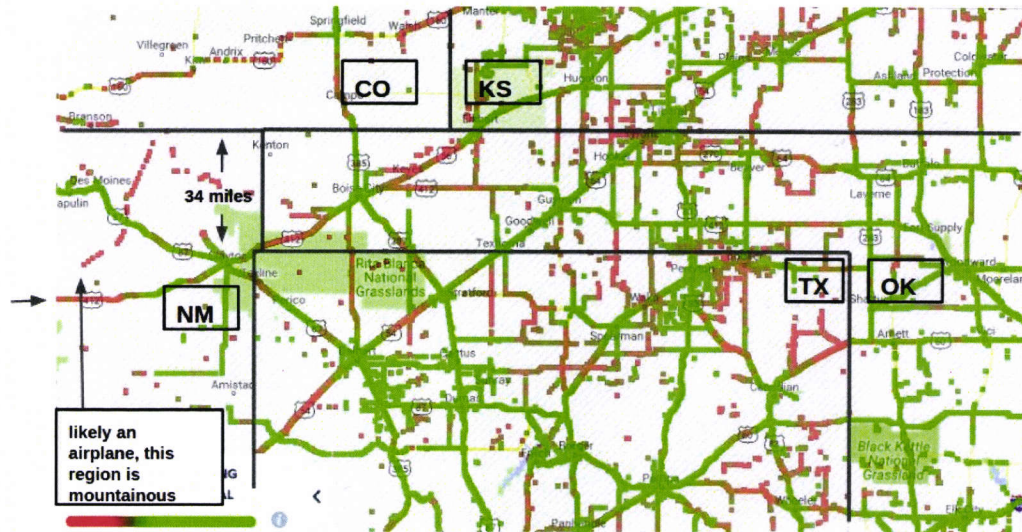
US states, acam winners and non winners



L53: Some small telcos got large sudden increases when the acam program was turned on. They would also presumably need a large sudden increases to their telecommunications services KPIs.



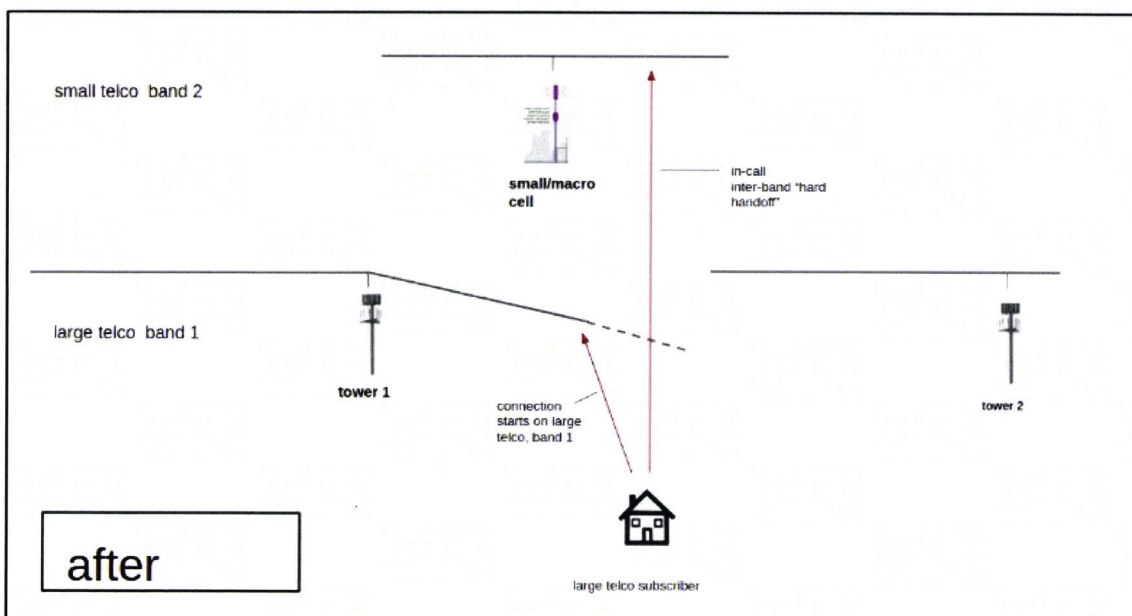
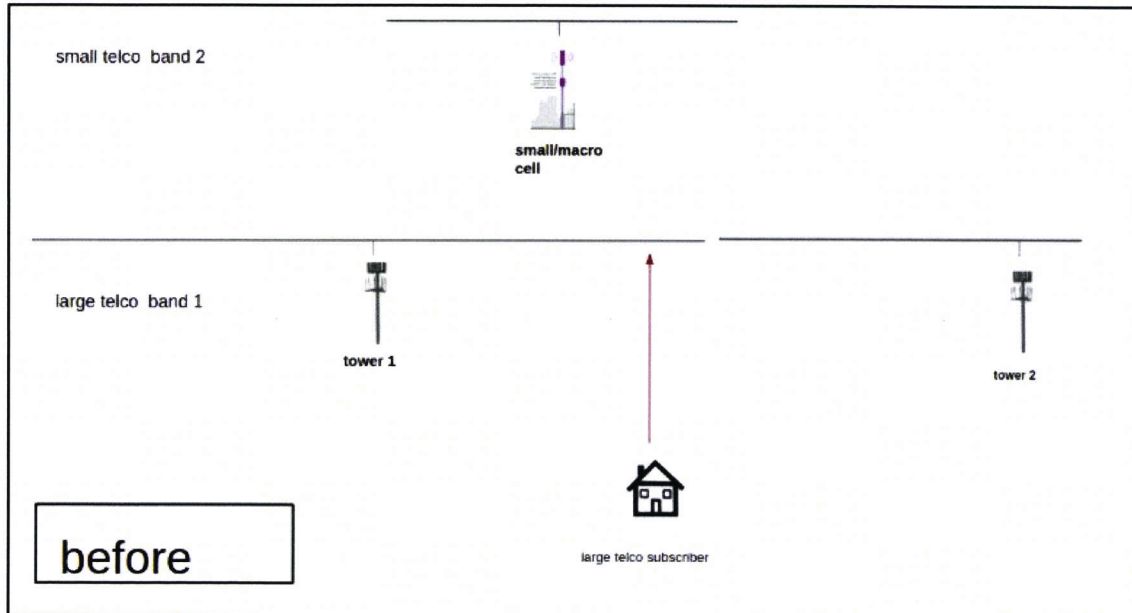
L54: Introducing red spots into an existing Verizon market would force more in-call inter-band roaming operations. The town of Keyes OK appears anonymously red in the OK panhandle. At the time I made this screenshot I also checked the signal strength for the small telco United Wireless and found that it had bright green coverage in Keyes.



L55: In 2014, it appears that there was an industry wide freeze enacted on smartphone based measurement systems (paragraph 37B). A plausible explanation for this is that the designers of the cacm/acam programs realized that third party smartphone based measurement systems could detect the wire fraud, either as the sudden appearance of a red spot or a highway gap in a large telco's network in the USF subsidy areas.

L56: Red Spots: dual band scenario

- adjusting the downtilt of an existing network element will force the existing large telco subscribers in the coverage area to do more in-call inter-band roaming operations.



[L-57] qui-tam and class action legal vulnerabilities

Under the legal assumption that USAC is part of the government, the large telcos are causing the small telcos to report false data to the government, which would seem to expose them to qui-tam lawsuits.

When the cacm and acam programs were turned on, there were several hundreds of small telcos that received large increases in their monthly USF payments. These small telcos must all survive random USAC audits that correlate their billable revenue to actual "telecommunications services" that they provided.

To use Pioneer Telecom as an example, the plot above indicates they received a 100% increase in their total USF payment starting in Feb 2017. The number of telecommunications services generated each day is relatively fixed in any given city or town, so for there to be a 100% increase in one specific small telco's network would be statistically impossible. Such a sudden increase could be made, however, by detuning the overlay network of a large telco, such as with a red spot or highway gap as shown.

L58: The small telcos that receive USF money are required to keep their raw KPI data for 5 years²². The detuning of the large telco's network would appear as a sudden and statistically impossible increase in the small telco's KPI counts.

L59: The small telcos are also required to deposit a portion (unknown %) of the USF monies into an approved bank for a surety bond²³.

L60: In the, so far unsuccessful, course of seeking legal representation for this matter, the plaintiff interacted with several attorneys that specialize in false claim cases. One attorney told me that qui-tam cases involving fraud on government contracts are numerous and easy to win. In my case the false claim is very complex and beyond the practice area of most qui tam attorneys. I was also told that these cases will come to a jury trial, and that they usually will have a whistleblower who "was in on it" to testify, which gives high confidence of convincing the jury.

This fraud has been ongoing since at least 2009 and possibly further and there are thousands of small telcos involved. Presumably, after 16 years of the USF program making monthly subsidy payments to these small telcos with very few questions asked or answered, there will be many

²² used to be 7 years but A. Pai recently changed it to 5 so more people could get broadband; I've lost the reference, but that was the jist of a public statement Pai made that I read.

²³ <https://www.womblebond Dickinson.com/sites/default/files/2018-03/Erin%20Fitzgerald%20RWA%20Testimony.pdf>

people (ex wives, former business partners, disgruntled employees, etc...) that have knowledge of some specific irregularities and could be potential whistleblowers.

Class Action

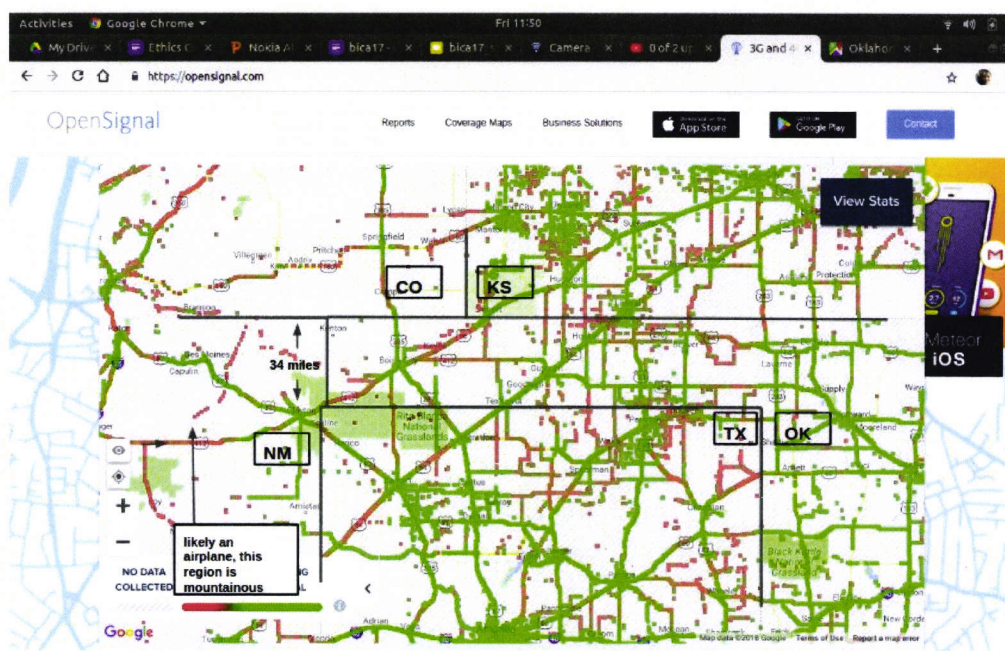
L61: As described in the main complaint, the defendants seemed particularly worried about a class action lawsuit. In the call with my disability advocate nurse described in paragraph 122, Christy (whom I suspect was being coached) developed a sudden and specific interest in class action law firms when the topic came up.

I have since learned that these types of lawsuits are often funded by individual investors or organizations such as hedge funds, or they are self funded by the pursuing law firm. In (Del Signore vs Nokia) the underlying fraud is being committed by the large telcos in collusion with both political parties. There may be individuals, organizations, or law firms that would want to self fund such an endeavor, but in the plaintiff's experience, the nature of the defendants provides a great disincentive.

L62: However the State Attorney Generals are in a constitutional position to prosecute this case as a class action. As described, the IL AG has been non responsive. A possible next step is then a 50 state campaign of volunteers to submit this information to all 50 state AGs at the same time.

[L-63] Industry Collusion 2018-2019

The PC based version of the OpenSignal heatmap tool was used in my second ethic report in Sept. 2018. This tool made the heatmap of the OK panhandle shown above. My ethics report was also submitted to multiple Federal email tip lines as well as ex parte to Verizon council Alan Buzzacott.



(screen shot of OpenSignal browser heatmap tool taken approximately Sept 2018)

Approximately one month later, I wanted to take more screenshots and I found that the tool had been taken offline. This tool had been online since 2011²⁴. OpenSignal is a privately owned company, however Wikipedia lists Qualcomm as one of the owners.

The PC based version of the tool would allow filtering by year and quarter. If the highway gaps or red spots appear coincident with the start of the cacm/acam programs, that would provide visual proof of the wire fraud.

L64: The smartphone based OpenSignal heatmap tool was left online however and I used it to collect further heatmaps as given below and in exhibit J²⁵.

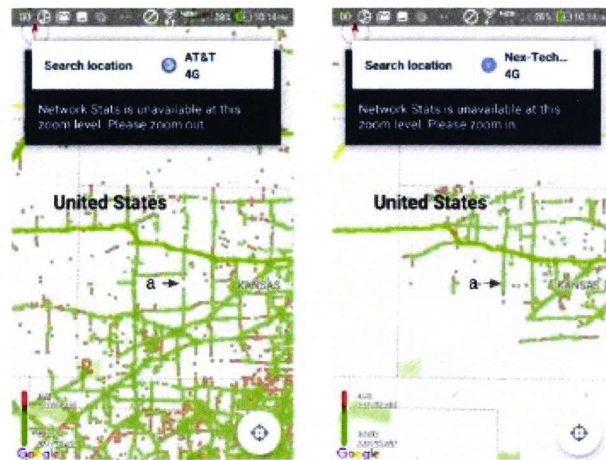
L65: In Nov-Dec I assembled the heatmaps in exhibit J using the smartphone based tool and then submitted this new information as an amended complaint in Dec 2018.

L66: Subsequently, it appears that the smartphone tool has been detuned further by reducing the time period over which it displays aggregated data. As can be seen below, this makes the gaps impossible to discern.

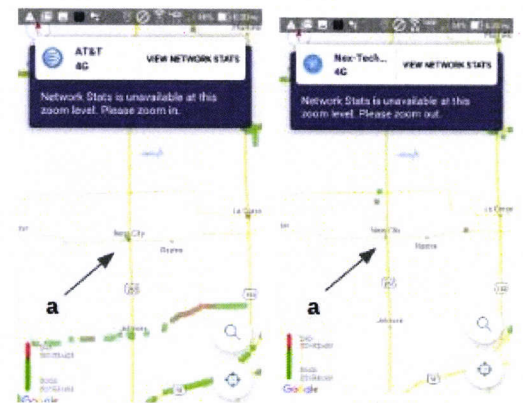
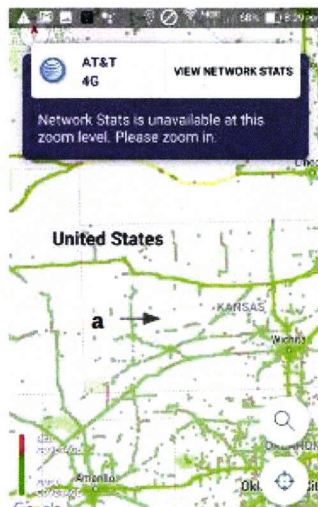
²⁴ <http://www.cnn.com/2011/TECH/mobile/02/15/coverage.mapping/index.html>

²⁵ Exhibit J: https://drive.google.com/open?id=1lnu5d8gB0YZ5saUB8d834zbyBu_fiAS

dec 2018:



july 2019:



Also noted from this data is the gap in the KA-OK panhandle region²⁶ is no longer visible.

²⁶ as detailed in complaint and Exhibit J

[L-67] summary of protected activities, blacklisting, and harassment
of the Plaintiff 2009 - 2018

The events listed below will be argued to be protected activities. A separate Motion for Summary Judgement will detail the points of law relevant to each statute for each protected activity. This section will add information specific to each event that has not been included in the main complaint or exhibits.

		covering statute:		
	protected activity	Illinois	SOX	CPFB
[]	2009 Verizon has too many roamers	X	X	
[]	2014 Kevin Ming Ken illogical meeting:	X	X	
[]	2015 Neil's 1.5 sigma Sprint meeting:	X	X	
[]	2018 Feb Shannon canceled	X	X	
[]	2018 June first ethics report:	X	X	
[]	2018 Aug witness list email thread:	X	X	X
[]	2018 Sept second ethics report:	X	X	X

Between 2003 and 2010, I had proposed and developed a series of technically successful projects on the company's 1x voice and 3G data systems²⁷.

I believe the blacklisting starts immediately after the 2010 field trial.

Following the 2010 field trial, my proposals for future projects began to be blocked; in particular any work that had to do with the new 4G system.

27

[20130059582 Adaptive User Equipment Registration for Communication Networks](#)

[20100120451 Method for paging a mobile unit based on previous network interactions](#)

[20090093263 Conservation of paging resources in a mobile switching center](#)

[20080161007 VACATING LOW USAGE PACKET DATA SESSIONS IN A WIRELESS COMMUNICATION SYSTEM](#)

[20080161004 ALLOCATING MEMORY TO LOW USAGE PACKET DATA SESSIONS IN A WIRELESS COMMUNICATION SYSTEM](#)

[20080101316 Method of excluding ineffective inter system page attempts](#)

[20070293245 Conservation of paging resources in a mobile switching center](#)

[20070281661 Method for determining if a mobile unit is transient](#)

[20060293037 Method for alerting a mobile unit of a missed call upon movement of the mobile](#)

[20050130624 Generating one or more triggered operations to prepaid service node based on connection with intelligent peripheral component](#)

L68-70: During the period 2010-2015, I believe I was passed over for promotion on two occasions. Each occasion occurred as a breakup of the group I was in into two groups with my existing manager taking some group members and the remainder being assigned to a new manager.

L71: In 2010, at the time of the field trial, my manager was Carl Spies. In 2004, Carl, myself, and Jen-Yen Ku had invented a feature called adaptive paging²⁸. After this, I worked closely with Carl and his group during the next several years and eventually joined Carl's group as a "performance architect" in approximately 2007. I worked semi independently while in Carl's group, however after the Verizon field trial in 2010, I recall that Carl said to me "I need to know what you are working on".

L72: Sometime shortly after the field trial, Carl made a surprise announcement on a group call that he was being moved to another department and the group was getting a new manager; also he said he was going to take some of the group members with him.

L73: Carl cast this change as administrative, but it is clear in hindsight that this was the equivalent of being passed over for promotion. The group members Carl took with him have all advanced within the company into 4G.

L74: Shortly after Carl made this announcement, I saw him standing in the hallway, talking to some other group members. I remember that when I approached them, Carl turned and looked at me, and when he did, his face dropped into a guilty expression for a moment and then he looked away. Based on this, I now suspect that Carl had been told to leave me behind at this point.

L75: My new Manager was Ming-Hsu Tu. I recall that we had our annual performance reviews sometime shortly after he became my manager and I remember he told me "I won't be able to protect you if there is a layoff". This struck me as an odd notion; I had just finished a major architectural project called "UATI compression" and I was deeply involved in the ongoing "data explosion" (internal name) that was occurring due to the rise in smartphone penetration in the US.

I had just met Ming and I thought at the time that his statement was just boilerplate new manager talk, however in retrospect, I think this statement he made was likely motivated by the blacklisting. After working with Ming for several years, I can attest that he is not a manager to use boilerplate phrases or say things he does not mean. I think that Ming may not have been happy about the situation and he worked to get my 2013 abstract to BLTJ accepted and published²⁹.

²⁸ <http://onlinelibrary.wiley.com/doi/10.1002/bltj.20241/abstract>

²⁹ <http://onlinelibrary.wiley.com/doi/10.1002/bltj.21651/abstract>

L79: This project was proposed in 2009 and was eventually killed. I reintroduced this idea in 2015 and it became the project that was killed by IPRC in the late Spring, preceded by the "Amit you know damn well it will work" meeting.

Both proposals were shown to provide decreases in the drop call rate. Improvements to the drop call rate were highly sought, so it is very peculiar that these features were killed. A likely explanation is that the DCR is somehow tied to the billable revenues generated at the small telcos.

This proposal makes use of the fact that most mobiles are stationary and if the mobile has recent failures due to weak RF, then this information can be used to modify the RF settings for subsequent connections. This proposal overcomes an architectural limitation imposed by the 3G standards to achieve this.

474112 Jun 25 2009 **LTE_high_level_paging.ppt**
837632 Feb 23 2010 **TP and AP PO.ppt**

L80: These files are presentations I gave at two separate bi-annual Verizon network planning meetings. These meetings were usually attended by about 40 Verizon personnel from different parts of the US. I recall that I had given talks at three meetings in a row and then my 4th talk was rejected and I subsequently wasn't invited to any further meetings.

The 4th talk may have been related to the USF wire fraud and the t_drop_int trial. In exhibit E³⁰, when I reintroduced the t_drop_int trial in 2015, I describe several possible ways that the current setting could be adverse to system performance. In 2010, in the 4th talk, I had found an anomaly in the reverse link throughput, where the average RL throughput, of an area the size of 1/8th of a typical US metro market, would suddenly drop by ~10% for random periods of time (1-2 hours), and then it would return to its previous trend line like nothing had happened. I was pursuing a theory that the reverse link power control mechanism was entering an anomalous state and causing this.

I recall going to the network planning meeting lunch event to discuss this anomaly with a Verizon engineer (whose name I cannot recall, but he was from Russia and replaced Gene Carrucci) that I had been working with for about a year. He said he had "seen that too", but otherwise he seemed tense and non engaging. Lori X, the ALU meeting organizer that I had worked with during previous meetings, also seemed to be tense and watching me at the lunch.

³⁰ <https://drive.google.com/open?id=1feCzMfQCGusTwM5XWQKsH7JGs7jBaP-x>

2805760 Aug 3 2010 **sho_drop_chalktalk.ppt**

L81: This is the original t_drop_int study. The anomaly was detected in the summer of 2009; the chalktalk and field trial were in the spring of 2010

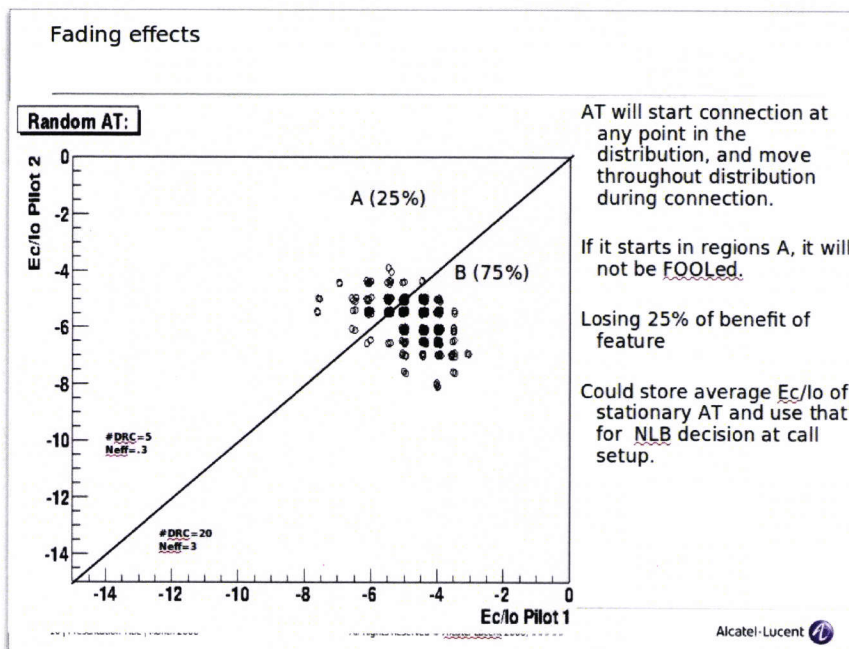
398336 Mar 15 2011 **EUPS_vs_Neff.ppt**

9160704 Jan 11 2012 **Neff_and_Shannon.ppt**

L82: These two documents pertain to a feature called network load balancing. This feature was invented by an engineer at Qualcomm and was implemented on the ALU and Ericson 3G switching systems in 2011. The first document is an analysis of the proposed feature by a Bell Labs engineer and the second is my same analysis, which was originally done in the Spring of 2011. This feature proved to be successful and was quickly deployed nationwide. The feature worked by offloading users from a loaded tower-sector to an unloaded adjoining tower-sector.

This feature has an anti intuitive basis and initially there was skepticism of it working; "that won't work, ...will it?" was a common first reaction. We subsequently held a meeting with the Qualcomm engineer and he explained that he had used a proprietary RF simulation tool to prove out the feature design. In his analysis, he had predicted an optimal setting for a parameter called "Neff" (number of effective users). I performed a separate analysis (above) using empirical methods and a simple monte carlo simulation and I got the exact same result for Neff.

However, from my analysis, I had also found that the initial feature design was only capturing about 50% of the potential benefit, due to the toggling phenomena. This is discussed in the excerpt below from my analysis.



447795 Oct 13 2011 **Network Load Balancing Feature Enhancement using AT Average.pptx**

L83: The finding above was eventually worked into this proposal to extend the original feature with a second software feature. I discussed this proposal with Sydney Bryson for several weeks by email and verbally and we eventually concluded that by simply changing `t_drop_int` by approximately -5 dB, the same benefits would be realized without the need to make any changes to the software. This was a very lucky development, like finding a hundred dollar bill on the ground at an airport.

Much to my surprise, Sydney, who was in Carl's group at the time, stopped responding to me after this.

1054446 Dec 3 2014 **DTX_Dormancy_Impact3.pptx**

L84: This is the presentation that detailed a parameter change that resulted in a 50% reduction in the 3G connection drop rate in the Sprint network and for which I was given an increased bonus in 2014. This is the proposal that was anomalously delayed by 4 months in the summer.

This change only discounted dropped connections in which the drop occurred after there was no further data to send (either direction) and the mobile was waiting to timeout normally (7s). The network wide drop call rate dropped by half, but the total number of connections made network wide did not.

I then used the software function DTX in combination with the 2009 design for “dynamic dormancy timer” to develop the feature proposal discussed in the complaint (paragraphs 51-57) that led to the “Amit you know damn well it will work” meeting.

2095170 Jan 27 2015 **EVDO Softslope T_drop_intercept Threshold Trial.pptx**

L85: This is the proposal that I made to redo the t_drop_int study from 2010 and that presumably caused Neil to try and fire me, again.

-rwxrwxrwx 2 kwd1 kwd1 84038 Apr 1 2015 **ken_3-25.pptx**
-rwxrwxrwx 2 kwd1 kwd1 340343 Apr 2 2015 **ken_4_2.pptx**
-rwxrwxrwx 2 kwd1 kwd1 975440 Apr 9 2015 **ken_4_9.pptx**
-rwxrwxrwx 2 kwd1 kwd1 418212 Apr 9 2015 **ken_4_9a.pptx**
-rwxrwxrwx 2 kwd1 kwd1 530601 Apr 16 2015 **ken_4_16.pptx**
-rwxrwxrwx 2 kwd1 kwd1 357710 Apr 28 2015 **ken_4_22.pptx**
-rwxrwxrwx 2 kwd1 kwd1 319906 May 6 2015 **ken_4_30.pptx**
-rwxrwxrwx 2 kwd1 kwd1 386765 May 7 2015 **ken_5_7.pptx**
-rwxrwxrwx 2 kwd1 kwd1 347887 May 7 2015 **ken_5_7a.pptx**
-rwxrwxrwx 2 kwd1 kwd1 657605 May 29 2015 **ken_5_21.pptx**
-rwxrwxrwx 2 kwd1 kwd1 267467 Jun 11 2015 **ken_6_4.pptx**
-rwxrwxrwx 2 kwd1 kwd1 218062 Jun 18 2015 **ken_6_18.pptx**
-rwxrwxrwx 2 kwd1 kwd1 226065 Jun 25 2015 **ken_6_25.pptx**
-rwxrwxrwx 2 kwd1 kwd1 111475 Jul 2 2015 **ken_7_2.pptx**
-rwxrwxrwx 2 kwd1 kwd1 423651 Jul 9 2015 **ken_7_9.pptx**
-rwxrwxrwx 2 kwd1 kwd1 366350 Jul 16 2015 **ken_7_16.pptx**
-rwxrwxrwx 2 kwd1 kwd1 432886 Jul 22 2015 **ken_7_23.pptx**
-rwxrwxrwx 2 kwd1 kwd1 117306 Aug 25 2015 **ken_8_4.pptx**

L86: Starting (ironically) on April 1st, 2015, Kevin instructed me to begin sending him weekly summaries of my work. I suspect that the Sept. layoff was scheduled at this time and that this was done to provide documentation for my coming layoff.

Fortuitously, I was able to (in Jan 2019) use these documents to reconstruct my work activities in the Spring of 2015 as described in the complaint.

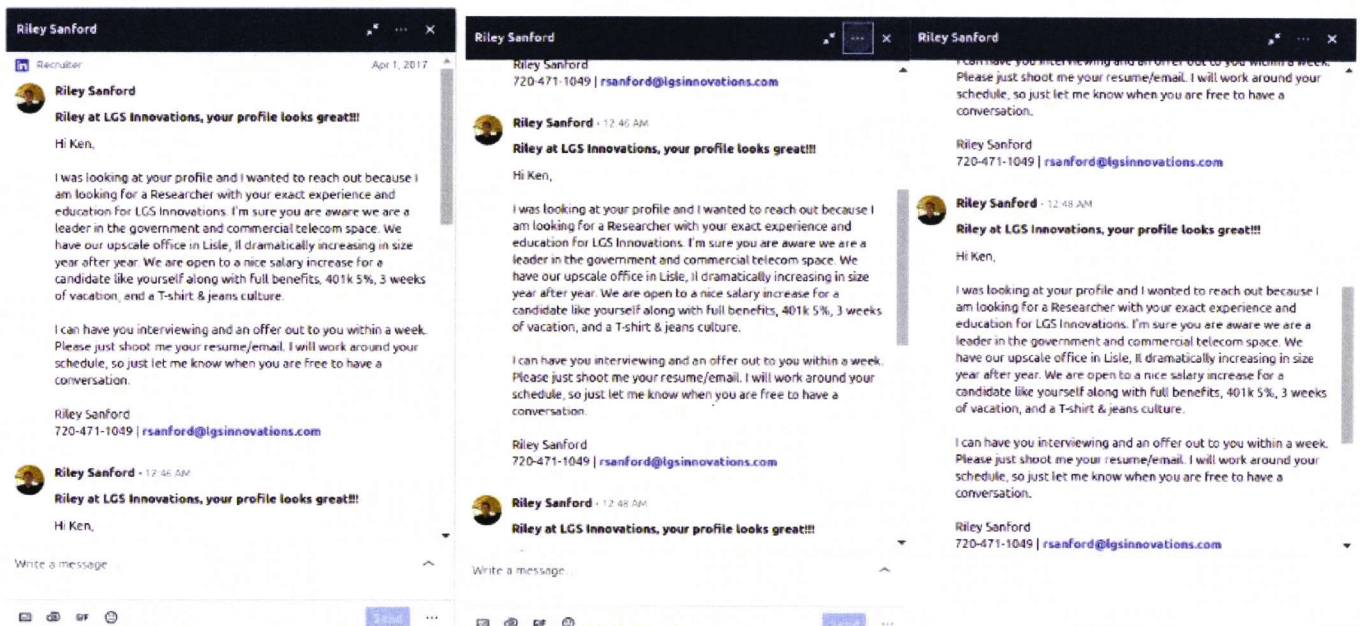
2015 Sept Layoff and offer of Demotion

L87: I suspect that I was offered the demotion instead of an outright layoff out of fear that I would file a wrongful discharge suit based on the anomalous events in the Spring. The plan would then be to lay me off in the next layoff that occurred in the test lab, which happened in Spring 2018.

LGS April Fools Day joke

L88: My assumption is that Chris Miranda would have to have authorized this. He knew me ten+ years ago when I used to wear Levis to work and was sending April Fools Day jokes company wide.

As noted in the complaint, this message now appears three times in my linkedin email account, which I would guess indicates the record has been manually touched and inadvertently altered.



2017-2018 "The Cloud" and the Shannon Project

L89: As described in the complaint, in the Spring of 2017 I found a new internal position in a division of the company called Applications and Analytics, working on "cloud" based projects. In practice this was an entry level service desk position maintaining rack based (cloud) servers. However A&A had been actively soliciting for new business proposals and I felt I could advance in career from the new position.

L90: The original project name was "pmud" (passively measured user data). The proposal was to pay several thousand people ~\$5 to install the app and let it collect usage data in the background. This data would be aggregated locally and uploaded periodically. As described in the complaint, my original intent was not to measure RF data, but rather to collect data on physical user interactions with the phone with the intent of finding flaws in the user interfaces using the analysis techniques from my 2014 BLTJ paper.

L91: In late Jan 2018, I was instructed to add "one or two more team members". I approached a longtime colleague Julian Giuo about the opportunity. Julian and I had worked together on various projects dating back to the early 2000s. Julian was working in the test lab at the time and was very interested in the opportunity as layoffs were rumoured to be coming.

L92: I believe what happened next is that Julian asked around about my project to gather other experts opinions on it, which would be a perfectly appropriate thing to do. There would be a risk for Julian if the project was cancelled after the 6 month trial period ended. If the project failed, he would have been more vulnerable to a layoff upon return to the test lab.

L93: Julian knew that Neil Bernstien had laid me off in Sept 2015. I suspect that Julian showed my project proposal to Neil. I think that Neil must have given Julian negative feedback about the project, because a couple days later when I next saw Julian, it was in a long hallway from about 50 yards away; we were approaching each other and I looked away for a second, and when I looked back Julian was ducking into a stairwell; and that's the last time I ever saw Julian.

L94: The job offer was however discussed with two other colleagues who were very interested in the opportunity and, in contrast, they stayed in close contact with me as the wild goose chases in Finland unfolded for the next two months.

L95: Neil's wife was the head of a similar Bell Labs project that was killed in 2014. I suspect that Neil went to the manager in charge of the business proposal program, Dione X, and told him to kill the project and gave him the noun: "Bell Labs Project". I suspect this because thereafter I had three

different excuses relayed to me from Dione and they were all based on some form of "The Bell Labs Project...".

L96: The harassment that occurs after I went on disability (May 7th, 2018) is described in the original complaint at paragraphs 98-131.

L97: In Jan. 2019 I accessed the archive of powerpoint presentations I had fortuitously made. This showed that I had reintroduced my t_drop_int parameter study in Jan 2015. I had previously documented Neil's Jan. behaviour with the explanation that he was trying to signal a negative connotation regarding my smartphone based measurement proposals (which I had been sharing with the Sprint team at the time). With this new information and from my expertise on the t_drop_int parameter, I knew that roaming counts due to toggling phones would have been largely eliminated and this allowed me to associate the 2009 t_drop_int study with the USF and the likely relation to billable revenues.